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CIRCULARS OF THE TESTIMONIAL TYPE.

Circulars, beyond a doubt, are very good things in their way, but unfortunately for those who receive them, and, having read them, allow themselves to ponder over the pabulum thus embodied, the innocent-looking black and white pages do not always contain the truth; in fact we might go further and say those minions of the quack seldom or never hold out the entire truth, and nothing but the truth. There is no controverting the fact that the average gas manager, or the one who is not fortunate enough to have an assistant to sort over the contents of his morning's mail, is the biggest sort of a target for the efforts of the circular fiend. "A. B. C." directs his attention to a patented process whereby coke is so cunningly treated that it is made to yield up a volume of gas, greater in volume and higher in candle power, than that originally evolved from it when it underwent prior distillation in the retorts in the shape of caking coal. "X. Y. Z." next asks him to bestow critical attention upon a method of causing gas to travel to any desired destination without the expense of putting down either mains or services, and both of these "inventors" back up their claims by "pointing with pride" to the "following testimonials." Perhaps we may have been mistaken a trifle in respect to the nature of "A. B. C.'s" and "X. Y. Z.'s" basis of claim, but the "testimonials" feature will be recognized as inevitable. But it is our duty at this time and here to "expose" one particular brand or description of circular, which has been widely distributed in the Middle and New England States, at the instance of various parties in the varying sections—for instance, in Boston, the agents operate under the name of the "New England Water Gas Company;" in Portland, Maine, as the "Maine Water Gas Company," in "Little Rhody" as the "Rhode Island Water Gas Company"—but in each case, despite the change in the branding iron, this particular sort of water gas "rose" may be smelled through the odors given off by Mr. Byron Sloper, inventor of an automatic water gas process, which he thinks will enable householders or individuals to assume the duty of making gas on their own accounts. In other words, he proposes that the future gas consumer may figure as the superintendent of his own gas plant. In the issue of the JOURNAL for Oct. 2, 1886 (p. 197), Mr. Frederic Egner furnished a dissection of the Sloper process, as exhibited in the city of St. Louis, Mo., and those who read that article are posted as to the real merit—which is pretty close to zero—of the Sloper invention as a gas producer. In fact it is hard to say what could have possessed the scribe who recently, in a New York quasi-technical publication, wrote down that "the name of Sloper will go down [he might with greater euphony have made it "slope" down] to history as that of a man whose genius revolutionized one of the most important social features of the nineteenth century," after having read Mr. Egner's communication to us on the subject. If Sloper or his printers had but stuck to the truth, even as he or they beheld it, all would have been well; or rather it would not have been so bad. And here is the deviation therefrom, which has caused the Goodwin Gas Stove and Meter Company much annoyance, and ourselves the receipt of many letters from parties wishing to know if it were thus and so. One of the circulars scattered broadcast through the East by the hands of divers of Sloper's agents, among other letters, contains a testimonial purporting to have been written by Mr. A. B. Stannard, Genl. Agent of the Goodwin Company, which nominally commits that Company to an endorsement of the Sloper gas as being far superior to coal gas in the operation of gas cooking and heating stoves, and also for the driving of gas engines. Having received a great number of letters of inquiry regarding the

genuineness of the Goodwin Company's endorsement we investigated the matter, and with the following correspondence reproduction take this method of answering all at the same time:

[*Letter from Mr. Stannard.*]

"OFFICE OF GOODWIN GAS STOVE AND METER CO.,
PHILA., PA., Nov. 18, 1886.

"*To the Editor* AMERICAN GAS LIGHT JOURNAL:

"The certificate with my name appended, published by the Rhode Island Water Gas Company, is entirely unauthorized by me, and is in no sense 'an opinion of the Goodwin Gas Stove and Meter Company,' as is stated. The Goodwin Company, neither individually nor as a company, had anything whatever to do with any tests of the process or machine alluded to; and the only way in which this certificate could have been manufactured, with any semblance of truth, was by abstracting from my personal letters to a party in another State, who denies that he ever allowed them to be used for that purpose. In short, I have no knowledge whatever of the parties publishing the circular. I never had any correspondence with them, nor did I write any certificate for them; and the issuing of such certificate is a use of the name of the Goodwin Gas Stove and Meter Company in which they have had no part whatever. Respectfully,

"A. B. STANNARD."

[*Letter from Mr. Goodwin.*]

"OFFICE GOODWIN GAS STOVE AND METER CO.,
PHILADELPHIA, PA., Nov. 18, 1886.

"To the Editor AMERICAN GAS LIGHT JOURNAL:

"Our attention has been called to a circular, issued by the Rhode Island Water Gas Company, which contains a certificate headed 'The Goodwin Gas Stove and Meter Company.' It is therein stated that the certificate expresses the opinion of this Company regarding the process of the Rhode Island Water Gas Company. This statement is misleading, in that it is calculated to produce an impression that the Goodwin Company has endorsed the process referred to and authorized the publication of the certificate. On the contrary, the Company has not tested the process, nor endorsed the same, nor authorized the issuing of the circular referred to.

"No one connected with this Company is authorized to issue such a certificate except by action of the Board of Directors, and then only over the signature of its President—who knows nothing about the process, has never tested the gas, nor even seen it burn. If the certificate referred to was given, it was done without authority, and the various persons making use of it have been notified to that effect. The following is a copy of the letter which has been sent them:

"'PHILA., PA., Oct. 25, 1886.

"'MR. H. R. ROSE, Secretary Maine Water Gas Company, Portland, Me.:

"'Dear Sir—We have been advised that in a publication you have issued, regarding your process for making gas and its adaptability to gas stoves and gas engines, said publication is accompanied with an endorsement said to have emanated from this Company. We desire to say that no such document has been authorized or directed to be issued by any of the officers of this Company; and, until the Company acts officially on this question, you, or any other person, are not authorized to attach our name, or the name of any officer or agent of this Company, to such a document. Yours truly,

"'WM. W. GOODWIN, President.'

"It will be seen, from the date of this notice, they were promptly notified that this Company had not endorsed that process; further, the use of our name was without any authority, and its continuance will not be tolerated.

"W. W. GOODWIN, President."

The matter, we think, needs no further comment on our part.

CLERK'S TREATISE ON THE GAS ENGINE.

Not many years ago those connected, in an engineering capacity, with the art or business of the manufacture of illuminating gas had much reason to complain of the scantiness of the literature which bore directly upon matters that interested them so deeply. Now, however, the reverse appears to be the case, for instead of scantiness they have profusion, and in consequence the gas engineer of to-day is often called upon to ponder the question as to whether the latest treatise offered in his particular line is really worth purchasing. Whenever any publication which appeals to the patronage of the fraternity seems to us to merit commendation and their support we frankly say so in our columns; and it gives us satisfaction to note that Mr. Dugald Clerk's treatise on "The Gas Engine" (reprinted by Jno. Wiley & Sons, New York city, from the original English edition), is a work that may with pleasure and profit be perused by gas men the world over. The book is divided into 12 chapters, and each of its divisions bears an impress of the thought and study of a calm, deliberate, honest mind—a mind also thoroughly conversant on the subject sought to be portrayed.

[OFFICIAL REPORT.—Continued from page 298.]

Fourteenth Annual Meeting of the American Gas Light Association.

HELD AT THE ACADEMY OF MUSIC, PHILA., PA., OCT. 20, 21, AND 22, 1886.

FIRST DAY—AFTERNOON SESSION—WEDNESDAY, OCT. 20.

Discussion on Mr. Ramsdell's Paper on Gas Commissions.*

The President—This is an important subject, and is of interest to us all. In view of the fact that Massachusetts furnishes us with a practical example of the operation of gas commissions, I will call upon our President-elect, Mr. M. S. Greenough, to tell us something about how the plan has thus far worked.

Mr. Greenough—What I may say on this subject can hardly be looked upon in the light of novelty, for my opinion on the question is perfectly well known. My only regret is that we did not have a commission in Massachusetts years ago. If that had been the case I do not think the gas companies in and about Boston would be in the condition of annoyance and anticipated loss in which they stand at present. It seems to me the opposition to gas commissions, on the grounds so far advanced, is not based upon satisfactory reasons. It also appears to me that no matter what sort of a commission you may secure—for of course it is possible that you may secure a commission composed of other than honorable and competent men—your case will be no worse than it is at present. Gas companies at present doing a legitimate and comparatively prosperous business—perhaps a profitable business, or a business which, so far as profits are concerned, its managers would be entirely satisfied to do if they were sure that it would be permanent—are liable to have a set of gentlemen descend upon them, who shall persuade the members of the city government that it will be to their advantage to have competition in gas, and get from them, by one means or another, permission to dig up the streets of the city. In such a case what is the old company to do? Everybody knows the problem, but no one so far has evolved an entirely satisfactory answer to it. Of course, gas companies would prefer to mind their own business, without any interference from any gas commission. If, however, you can obtain protection by exhibiting your affairs to a commission, and submitting to such suggestions as may be made by a commission, why is it not infinitely better to do it than to run the risk of competition and the attendant loss of money? The gas commission of Massachusetts has now been in existence for a year and a half. The gentlemen composing it were invited to be present here to-day. I waited upon the president of the Massachusetts commission and asked him if he would not give us the benefit of his own judgment in the matter at this meeting in Philadelphia; but he, perhaps very properly, declined to express himself upon the matter at present, thinking it better for him to wait until he had more thoroughly mastered the subject than he had been able to do in one year. These gentlemen have been working hard, and they have propounded to the gas companies in Massachusetts some very serious conundrums on every possible subject connected with their business. Every gas company in Massachusetts has had to exhibit the most private details of its business to the inspection of the gas commission. What harm has it done to have those details examined? I have heard of no injury to any company as yet as the result of such an exhibition of its affairs; and there is this to be said unquestionably in its favor—since the gas commission has been established in Massachusetts no petition has been presented for its members to act upon in regard to competition in gas making. The business of competition in Massachusetts has been knocked on the head by the appointment of this commission. (Applause.) The gas companies outside of the city of Boston now rest assured that they will be protected in their conduct of a legitimate business; and if that is not sufficient compensation for turning over your affairs to a gas commission then I am in error. The real difficulty about the working of our commission is that really it has nothing to do. If we may judge by the newspapers of Massachusetts, there has seemed to be a great deal of dissatisfaction with gas companies there; but when the gas consumers were given an opportunity to make their grievances known to the gas commission, and to have them redressed, no one came forward to make complaint; nor has a single one of the set of nomadic benefactors who go about the country seeking to build up competing companies put in an appearance in Massachusetts since this law was passed. (Applause.) If that is not an argument in favor of gas commissions I do not know what can be brought forward. I rather hoped that Mr. Ramsdell would accompany his paper with a resolution which should go on the record of this meeting as an expression of the opinion of the Association in that direction. I think the Association ought to speak with no uncertain voice as to its opinion of a gas commission based upon the broad principles of equity and justice which Mr. Ramsdell has outlined. We do not undertake to say that the law establishing a gas commission in Massachusetts is the best of all possible laws; but at the same time

**Ante*, p. 296.

I think the judgment passed upon it by Gen. Hickenlooper,* at the meeting of the Ohio Association (March, 1886), was somewhat uncalled for. If he can get a better law in Ohio than we have in Massachusetts let him do so. Of course a great many gas companies do not want any gas commission appointed unless it is going to place the cold end of the poker in their hands. Well, let us see him get a law of that kind. If they can get a law through the legislature allowing them to go on and pay 20 per cent. dividends on watered stock, so much the better for them; but I do not think they can do it, and we did not try to do it in Massachusetts. I think we have a fair law. It is a tentative one, because the first of the kind that has been framed. It is possible, of course, that a law can be established, in the light of subsequent investigation, by other States which may work better both for the gas companies and the public; but the law as we have it now in Massachusetts is a good one. It is a law which protects any company doing a legitimate business; but any company that undertakes to make too much money is likely to get hauled up. It would not surprise me to hear that the gas commission had recommended that some of the companies reduce their price. Of course this would not gratify that particular company; but that company, if called upon to do so, may rest assured of being thereafter permitted to enjoy a legitimate rate of interest on a legitimately invested capital, and that the commission will protect it against the raid of any of those gentlemen who organize themselves together for the sake of benefiting the community. I think this is an assurance worth having. I trust some expression of opinion will be made by this Association upon the subject of gas commissions.

The President—Of course the establishment of gas commissions can be accomplished through the legislatures of the several States. We occasionally read in the newspapers about corrupt men being in the legislatures; but we have with us a member of a State legislature in whose integrity we have the fullest confidence. There may be other gas men who are legislators. We would all like to hear an expression of opinion from one man who undertakes to make laws for one of our States, and so I call upon Mr. Stedman, of Rhode Island, to tell us where, in his opinion, his legislature stands on the subject of gas commissions.

Mr. Stedman—I find the average American community to be permeated with a good deal of practical common sense, which if appealed to, rather than to its prejudices, will give expression in a good, common sense result. I find that committees of legislatures, if properly approached, are responsive to the logic of good, sound, common sense. I think there is no danger at all in appealing to the average legislature, or to the average community, by setting forth the justice and equity of the case between the local gas company and the community itself. Appeals are always being made to the prejudice of the people as against gas companies. There is a good deal said or written in a half facetious manner, cloaking perhaps some little feeling of antagonism that may have resulted because of an unexpectedly large gas bill, or because of some failure to adjust a fancied grievance in accordance with the idea of the party who made complaint. A good many of the little flings thrown at us in the local papers have their origin in just that way; but I do not think these things go very far towards influencing the general opinion of a community. We look at such an article in a newspaper, and it seems to us as if it voiced the sentiment of the whole community; but you find, on talking with your customers, that it is not so. A great many look at it merely from a facetious point of view, and remember it only as one of the many jokes against gas companies. I believe, if the affairs of the companies were shown to be conducted on an equitable and just basis, that you would find the community ready to protect the interest of the gas companies. Of course, all gas companies have stockholders who largely represent, and in a great many cases control, the local sentiment—or ought to control it, and could control it if they exerted themselves to do so. If it is possible to put your case before an investigating committee, so that you can show them you rest your claim entirely on equity and justice—if you can show that you have served the community well; that you have been fair and equitable in your dealings; that you have only asked for a fair profit, and have given in return a good quality of gas; if you have reduced the price of gas from time to time when you found you could do so with a proper consideration for the rights of stockholders, and in justice to the community—then you can trust to the sense of fairness in the community to decide according to the merits of the case. If, on examination, it is found you have been exorbitant in your charges, and that you have been a burden on the community instead of serving them properly, you must expect to be treated accordingly. If you can go before the legislature with your case fairly represented—I do not know how it is with other legislatures, but do know how it is with the legislature of Rhode Island—you may be certain of getting your deserts. I remember that very recently its case in equity was presented by a company to our legislature, and the decision was entirely in its favor. The case came up as against a competing charter, and the company showed its affairs during its whole existence to the committee of the legislature. It was able to show that it had dealt fairly with the public, and the committee decided, to a man, adversely to the competing company; in fact there were only three in the whole legislature who voted against the decision of the committee and in favor of the competing company. I earnestly believe, if you can only get the public to understand we are perfectly willing to let them see our figures, if necessary (and could be assured the knowledge given to the public in that way would not be used to our disadvantage), if they, or a committee appointed by them, could look at our books to see exactly where we stand, and to ascertain whether we do serve the public faithfully, or whether we have been greedy and avaricious and regardless of the public rights, I believe that nineteen out of twenty of the local communities would give us a warm and hearty support. Therefore, I am very strongly in favor of a commission in any State possessing a large number of companies, which shall stand as an arbitrator between the community and the gas company. In our affairs in this country we are very fast coming to an agreement as to the wisdom of arbitration in the settlement of differences. In very many of the business enterprises of the country you will find that boards of arbitration, appointed by competent authority, exist, and with power to enforce the decrees adjudged by them in cases as between man and man, and as between employer and employed. I think that, as between communities and corporations, just, fair and equitable results can be secured in the same way by the appointment of commissions of arbitration which shall have power to enforce their judgments. I think that it is only foreshadowing what is inevitable, if we ask that gas commissions be appointed. It is only right and just to the companies and to the communities that they should be appointed. It is something this Association as a body ought to be particularly interested in; and we ought to be able to shape somewhat the result of these agitations which are going forward in the communities. We may be able to do so by taking early steps to have the public, and the lawmakers especially, understand exactly what our case is before they are called on to act upon it. We should be ready at any time when we find our local legislatures are considering the subject to go to them and lay our case before them. Whenever we find a public sentiment moving in the direction of securing domination and control over us, we should be ready to meet that feeling with our facts and with our figures, and be prepared to say, "This is our case. We ask you to consider it as well as that of the public, and to make an equitable adjustment of differences between us." We have got to be there when the time comes. We must be ready to respond then; and we had better be moving in this matter a little in advance of the public, so that we shall be able to shape legislation—not in the line of our interests alone, but simply in the interests of the public and of ourselves, so that the case as between communities and the gas companies shall be considered together, and an equitable and just settlement be made. I know that many people say gas companies cannot stand competition, for as soon as competition against the gas company is talked of its managers cry out for protection. Those who say it do not understand the nature of the case; they do not understand the peculiar relations of gas companies to communities; they do not understand, and do not appreciate, that money sunk in the ground in the building of the deep tank for your gasholder, or in the laying of long lines of service pipe, cannot be picked up at any time and transported into some other business, as is the case in many other manufacturing enterprises. Consequently, they do not understand at all the justice of our claim when we say we want this protection for this special interest. We do not ask for protection selfishly, but simply because we do not wish to have our property wiped out without proper consideration being given to us. We do not want to be flung aside and made to endure the penalty of tremendous loss simply because we have not gone before the public, stated our case, made our position understood, and convinced that public that we have endeavored by fair dealing to do what was just, right and proper. So, when the communication came from the Western Gas Association on the matter of gas commissions, I read it with a great deal of satisfaction, and gave it in my own mind hearty commendation. It seems to me anything which our Association can do to further this object, especially in the larger States, should be done. In the smaller States we seem to be nearer to our legislators. In Rhode Island everybody knows almost everybody else; and when we wish to see a member of the legislature with regard to some needed legislation, we can call upon him, shake hands with him, and say, "This is our case; we want you to consider it fairly." We can put all the figures right before him. In a large State, like New York, the managers of the local gas companies do not know the men who rule them. We can reach our legislators in half an hour's time; and if we want any special legislation when the legislature is not in session we can apply to the Governor and get him to have the legislature convened right off in Providence for a session; but that you cannot do in other States. In the larger States I think the community of interest existing between the gas companies and the public ought to suggest to the companies the importance of being on the move, ready to start the legislature on the right track before the car of public prejudice runs them down. It is the prejudice excited against the companies by men who are anxious to antagonize them in the eyes of the commun-

*See JOURNAL, April 2, p. 192, ¶ 6.

ity which is always apt to lead to injustice. It is that which we should seek to avoid or to prevent by promptly moving in the matter ourselves.

Mr. Pratt—I have listened to the paper of Mr. Ramsdell with very great favor. It is not only ably written, but it presents the arguments in favor of gas commissions in a very telling manner. I thank him heartily. Competition in the gas business, as has been remarked, is a matter which people do not seem to understand. We know, and it is not necessary here to bring arguments to so show, that competition in gas making is very different from competition in any other manufacture. All other manufacturing enterprises have the world for a market; whereas gas can be sold only where it is made. If but 500 million feet of gas be wanted by a particular community, the organization in that locality of one or two additional gas companies does not increase the output. Common sense teaches us that competition in gas making is not only ruinous to the gas company, but it injures the people as well, because it must necessarily lead to an enhanced price for gas. I think it is very clear to those who have been observers of the movement of public sentiment that the gas industry has got to place itself under State control. We are in such position that we cannot protect ourselves, as has been well remarked in the paper read to us, and we have to seek the protection of the State. I know it is argued that State commissions cannot be trusted; but I entertain no fear on that score. Let us see that honest men are appointed; and if gas managers have not sufficient tact, ability, and common sense to attend to their case before a gas commission composed of honest men who have no interest in the business, and whose only purpose is an equitable adjustment of the rights of companies and communities, then those managers had better resign and permit some one else to take their place. I will again remark that gas commissions, if appointed at all, must ostensibly and practically be appointed in the interest of the people, and but incidentally for the supervision of gas companies. I take it that if gas companies ask the legislature to appoint a commission solely for their own protection, they would likely meet with a negative answer. Quite likely they would be met by the assertion (now so common) that the company is a monopoly, being organized to make money out of the people, and that therefore no necessity exists for appointing a commission to protect the company. But if we ask the legislature for a commission in the interest of the public as well; if we propose to open our books and our works to their examination; to ask them to act as a board of arbitration in the settlement of differences; if we ask them to appoint a body of men from their own ranks, who have no financial interest in gas companies, to decide all questions which may arise between gas companies and the people—then I think that much good can be accomplished. Still, in asking for the appointment of gas commissions we should be careful not to propose arbitrary and unreasonable conditions. I am lead to this suggestion from the remark made by our President-elect when he referred to the attitude maintained by Gen. Hickenlooper, who, while somewhat opposed to gas commissions, was willing to concede that these might be useful provided certain restrictions were enforced. In the majority report I note a sentiment which I think would hardly meet the approval of a legislature, or rather it suggested a condition not likely to be granted. The majority report recommends that the Association record itself in favor of gas commissions, provided gas companies were allowed to divide 10 per cent. on a basis equivalent to $10 of capital for each thousand feet of gas manufactured. I do not possess figures showing the capitalization and output of the Western companies, but I have them for the State of Massachusetts. I suppose the cost of gas as between Massachusetts and the Western States does not vary much.

Mr. Ramsdell—I wish to correct Mr. Pratt in one respect. The majority report did not simply recommend that gas commissions be established if it could be done on the basis noted. They recommended that gas commissions be established, and also that that should be the recommendation as to the basis of profit.

Mr. Pratt—I want to show how such a recommendation would affect the business in Massachusetts. In that State there are 71 gas companies, whose entire capitalization, including stock, bonds, and debt, is $11,890,447, and the quantity of gas annually sold is 2,230,668,508 cubic feet. I suppose a 10 per cent. addition to that would be near enough to show the quantity of gas manufactured—giving a total of 2,453,735,358 cubic feet. The proposed basis of capitalization would permit the companies to charge a price for gas that would enable them to divide $2,453,735, or equivalent to about 21 per cent. on their present capital. Comment upon this is hardly necessary. What consideration do you think we should receive from a legislative committee if we asked them to authorize the appointment of a gas commission with the understanding that our present rates for gas would not be interfered with until after we returned a dividend of 21 per cent. on our capital? Having given you the average, allow me also to show how the plan will affect individual companies. Mr. Greenough will pardon me if I suggest that his company would be allowed to divide 44 per cent. on its capital; the Roxbury Company, 22 per cent.; the Lowell Company, 33 per cent.; the Charlestown Company, and some others, about 15 per cent.; but most of the small companies would divide not much more than the present rate of payment on their capital. The reason for the latter you will attribute to the fact that the capital of the smaller companies is necessarily larger in proportion to output than that of the larger companies. Many companies capitalized at $200,000 could perhaps treble or quadruple their output facilities by an increase of $75,000 to $100,000 in their capital, or an increase of 50 per cent. in the capital would permit an increase in output of 300 per cent. or over. For example, the Boston Company has a capital of $2,500,000 and an output of 1,000,000,000; while our Company (Jamaica Plain) has a capital of $200,000 with an output of 25,000,000. Thus the Boston Company, with but 12½ times our capital, has 40 times our output. It is altogether true that our companies would never be permitted to charge a price that would enable them to pay a dividend on the basis referred to. Hence the unreasonableness, I may say, of the condition proposed. The principle is wrong, and it would not be recognized or tolerated when its result is seen and demonstrated. It is unequal in its bearings upon different companies. I claim that the only basis the people will ever accept is that which allows us to charge a price for our product that will enable us to divide fair and reasonable dividends on capital absolutely paid in, but not on stocks that have been watered until they represent $10 of capital for every dollar invested in the plant. (Applause.)

Mr. McMillin—To show the sentiment prevailing in Ohio on this subject I would say that our local Association at our last meeting almost unanimously favored gas commissions; but the delegates who attend these conventions are not always the ones who are to *decide* questions of that kind. The decision rests with the directors of the companies. In view of this the Association instructed its Secretary to print Gen. Hickenlooper's address, together with the resolution and discussion evoked at the convention, and to mail copies of same to all the gas companies, with a request that the companies take official action. Ohio possesses nearly 100 gas companies, and I think about 78 per cent. of these responded favorably to the proposition to appoint a commission; one-half of the remaining 22 were undecided, and the balance opposed a commission in any form. I wish to say, since Gen. Hickenlooper's address has been referred to here, that that address was heartily indorsed by the Ohio Association; and we must all admit that Gen. Hickenlooper is a pretty successful manager of gas interests. I think, in the end, we shall find he is about right, for he always gave himself plenty of margin. In Ohio the capital in proportion to output is about $8, and not $10, as has been suggested. In Columbus the rate is but $4. I think it would be very unjust to ask the legislature to pass any law which would give a gas company the right to make 20 per cent.; and yet there are two sides to even that question. I do not know that it would be any worse to ask them to legalize that than to ask them to permit companies to charge a price in one locality which, if the same price were paid in another place, would enable the company to make 20 per cent. If we at Columbus received a price equal to that obtained at Jamaica Plain by Mr. Pratt we would have no fear about making 20 per cent. without an act of the legislature. I do not see much difference between permitting it and legalizing it. Certainly, in view of the expression of opinion by the Ohio Association, and the returns which that Association have had, as well as the action of the Western Association on this same matter, we feel justified in assuming that the gas companies of the West are pretty nearly solid in favor of gas commissions. I think you will have a great deal of trouble in framing a law which will meet all cases. I am quite sure the law suggested by Gen. Hickenlooper would not pass the Ohio legislature, because it provided for the selection of one member of the commission by the gas companies, or by the Association. That would be unconstitutional, not only in our State but probably in most of the States; since it is the province of the Governor to appoint, and of the Senate to confirm. Gas companies are not authorized under the constitution to make appointments; therefore the proposed law will fail for that reason. But the committee of the Ohio Association will at its next session prepare and present to the legislature a law on this subject.

Mr. Boardman—In regard to an allowance of 10 per cent. profit based on a capitalization of $10 per thousand of output, I will say that I understand the recommendation of the Western Association to mean that the commission should allow $10 per thousand feet output as the capital on which 10 per cent. might be made; and it did not say that every company then existing should have the authority to issue stock up to the proposed amount. The recommendation was in effect the same as that which the railroad commissions in several States have made a law—where the power to make law was granted them—that a certain rate per mile may be charged. It is not said the rate laid down must be charged, only that its exaction is allowable under certain conditions. The successful roads, and particularly those operating long lines, never charge the maximum amount. The law is meant to protect the small and struggling roads. Applying it to our own case, it would simply be the legalization of a fair return upon the capital invested in small plants. An error, I think, has been made in quoting the capital invested in gas plants in Massachusetts, in that the bonds have been taken at

a portion of it. If the affairs of gas companies were investigated by a proper commission any existing unfairness would be rectified. The law would simply provide that the maximum capitalization should not be carried beyond certain figures. There are many companies in the border States—where there are but few gas companies, where money is scarce and readily commands a high rate of interest—with respect to which I do not think the recommendation is at all out of reason. A fair capitalization, not to exceed $10 per thousand cubic feet of output, on which 10 per cent. may be made, I do not think would be at all unfair in places where capital can demand and does receive from 8 to 10 and 12 per cent. in other industries. (Applause.)

Mr. Pratt—The bonded debt of the Massachusetts companies is very small. Capital and bonds included the entire sum is short of $12,000,000. What I meant to be understood as saying was that the gas managers of Ohio and other Western States may not be able to go to their legislatures and induce them to give gas companies the right to make such enormous profits. Indeed I think, under those circumstances, they would be likely to defeat the object they desired to accomplish. In short, my theory is, instead of asking for the privilege of making a certain percentage of profit on the output of gas, all that gas companies are entitled to is a fair and reasonable dividend on the actual capital paid in and invested, without any reference whatever to output amount.

Mr. Littlehales—I have been a much interested listener to this discussion. I was delighted with Mr. Ramsdell's paper, and it certainly is judicial in its character. I remember at one of our early meetings having conversed on this subject with one of our ex-presidents—the late Mr. Price—and was then convinced of the desirability of the creation of gas commissions. Every succeeding year has made that conviction more firm within me. I firmly believe, and I predict it here to-day, that the results of the working of the Massachusetts commission, before three years elapse, of as soon as the bearings of the question can be understood, will not only be to prevent competition there, but that a proposition will be made to amalgamate the Boston companies. I think the tendency there will be as it has been in London. It will be found that the people have a certain amount of good "horse sense," and that the people of the United States possess it in a very large degree. Just so soon as they figure up for themselves what must be the result when two or three companies are endeavoring to do the work that one company could do better, just so soon will those commissions "sit down" upon competition. Of course the companies will have to grant something as an equivalent return for the monopoly that they will gain; and I think the suggestion of Mr. Pratt will be the one that will be found to be the best after we have had an opportunity to judge of the matter from experience. This allowance of ten per cent. profit on $10 per thousand of output is, in my judgment, simply monstrous. The company that I represent has a capital of about $5 for every thousand cubic feet of gas made. My own judgment would be in favor of some such plan as that outlined by Mr. Pratt—an allowance of a fair profit by way of dividend upon the actual capital invested. I do not think Mr. McMillin's objection to that plan has any force. He says while in one place it would be unjust to allow them to charge such a price, others would be allowed to pay a higher dividend in another place. As between the situation of our friends who live in Pittsburgh, where the coal is right under their feet, and we who, living at a distance from the mines, have to pay freight charges for a carriage over 200 miles or more, the conditions are widely different; but the commission would take such facts into consideration; and right there Mr. Pratt's suggestion will apply with force. I am satisfied it will be an unmixed benefit to the gas community to have these commissions exist. I hope some resolution will be brought forward which will warrant the gentlemen representing this Association in bringing the matter before their own boards of directors. As has been well observed by many members, it is not the engineers, the managers or the secretaries of companies who determine and guide the policy of these companies; nevertheless these recommendations, when backed by the collective wisdom of this Association, will have a decided influence in shaping the policy of their boards. The latter, when they find that the men who are practically acquainted with the necessities of the case, representing companies on all parts of this continent, reach a certain conclusion as to the best policy to be adopted, I feel sure that the expression of such conclusion will exercise a potent influence in deciding the boards of directors in different localities to ratify the action of this Association. I may add, my personal experience in this matter has been altogether in its favor. In England, as you are all aware, instead of a gas commission they have what practically amounts to the same thing. They are governed by very rigid rules, framed by a special committee of the House of Commons, which sits for the consideration of gas questions only, every member of that committee having an intimate knowledge of almost every fact connected with every company. When a company seeks any charter powers its proprietors have to show to that committee, as they would show before a court of justice, what their probable output would be, what their capital outlay will be, and what it will cost them to make gas and deliver it at the consumers' meters. They have to prepare and submit a probable balance sheet. Having done so, the committee will say, for example, it is evident that six shillings per thousand would be a fair price to charge for gas, and we will allow you to make a dividend of ten per cent. on that capital. We will allow to you a little margin over that, so that in case of a strike, or of some unexpected circumstances which may increase your cost for any one year, you may, if necessary, increase your price; but it is expected that you will only charge six shillings as the maximum price. Not one company in a hundred charges the maximum price. They sell under it, and in accordance with a sliding scale. I believe some of the London companies are to-day paying 13 per cent. dividend while selling gas at sixty cents per thousand. With commissions the community, in return for this concession, will get cheaper gas; and, in my judgment, it is the only way in which they will do so. It is the only way to prevent injurious competition, too. You have often observed when a company is reputed to be making money some one will seek to interfere with its business. Some companies maintain that the only way to protect themselves against such risk is to charge high prices for gas, and so store up a capital with which they will be able to recoup themselves when competition comes. One effect of the policy is that when stockholders have become accustomed to receiving high dividends they are very averse to accepting smaller ones; but they and we must accept the fact that the day of high gas prices is over. My own impression is the gas of the future will be sold at $1 per thousand. [Applause.] I think we must all come to that. I am satisfied the gas companies of this country will not now be very long in reaching that figure. I am happy to be able to say the company with which I am connected long since adopted the policy, without being compelled to it from any governmental interference, and has announced very frequently it is its intention to maintain the plan. In view of the risk in the gas business a ten per cent. dividend is not excessive. I have never yet heard a consumer with whom I have spoken on the subject say that a ten per cent. dividend was too high for a gas company to receive, in view of the risks to which its business was exposed; but I also think it is the true policy of any company to give the consumers all over that. That policy has resulted in our city (Hamilton, Ontario), without the slightest outside pressure, in bringing gas down successively from $3 to $2.50, $2.25, $2, $1.80, and $1.60, which is the present charge to the ordinary consumer, while $1.50 is the rate to large consumers. Remember, too, our annual make is about 50 millions cu. ft. It must be borne in mind we have not got the coal under our feet, as some favored companies have, but that we have to obtain it from long distances. Now, if we can do that in our small works, and under such circumstances, how much more easily can it be done in large plants more favorably situated. I am satisfied that just so sure as commissions are appointed, just so sure will we kill off competition. I am satisfied commissions will do it, and I am satisfied that that is the only way of doing it.

Mr. Beal—Gas is coming down to $1 per thousand in New York with a rapidity perfectly frightful. I may say that in New York city more money is invested in gas plants than is the case in the entire State of Massachusetts, and more perhaps than that invested in several States in other sections of the country. As a stockholder in a New York city company, I am, with my associates, very much interested in knowing what the feeling about gas commissions is throughout the State of New York. I notice we have here to-day representatives from different sections of that State, as well as from other States of the Union; and I would be very glad indeed to know if a majority of this Association really favors the plan of gas commissions, and whether the members are willing to put themselves so on the record. Such an expression of opinion will help the smaller companies in New York to obtain a gas commission from the legislature of New York next winter. I take the liberty of calling upon President Wood to state what sentiment is entertained in this respect in his community.

The President—As far as I am concerned I may say I am decidedly in favor of the appointment of a gas commission; but I cannot speak for my neighbors, the gas managers of Central and Western New York. We have with us the President of the Central New York Gas Engineers Association—Mr. John McDougall—and perhaps he could be prevailed upon to give us his views on the question. Mr. Cartwright, of the Rochester Gas Light Company, is also here, and consequently may be appealed to.

Mr. Cartwright—From the evidence so far given, we in our city favor a gas commission.

Mr. Lansden—This, I think, is a matter which must be left to the State organizations. This Association can only express its opinion, and endeavor to impress upon members of the various State organizations the necessity of attempting to secure legislation that will meet the different requirements in each particular State. I do not think we can properly here consider questions about the duties of gas commissions, such as capital allotment to dividend, etc. As I understand it, the question here is whether this Association will put itself upon record as advising that the interests of the gas business at large require members of the gas fraternity throughout the various States to make effort to procure this kind of legislation. The only way in which

we can work to secure that end is to impress its importance upon the members of the local associations in the different States.

Mr. McDougall—In the State of New York this gas commission project has been looked upon pretty much the same as the Broadway railroad steal has been viewed. An idea prevails in New York State that the New York city companies have obtained dividends altogether too large out of their gas works; and the time is coming (I think we will see it next winter) when New York State will have a gas commission. I think there is no question about it; and I believe it will be forced upon them. Thinking thus, it seems to me the engineers assembled here should come out flat-footed, and insist upon having a commission. If the commission to be secured will be composed of honest men there can only be one opinion as to the merit of the policy.

Mr. McDonald—I may perhaps know something about legislation in regard to a gas commission for the State of New York; and I would say to the gas men of that State, if they expect or desire to have any voice in the framing of such legislation they had better be up and doing, for action will undoubtedly be taken in the premises at Albany this winter. I think it behooves us to call upon the gas men of the State of New York to protect their own interests.

Mr. Page—Before this discussion closes I would like to add a word. This is the most important question that can be investigated by the Association, when we consider its future effect upon the gas industries of the United States. It is the sort of protection which this industry must receive, otherwise, in many of the smaller cities and towns, as to-day is the case in some of the larger ones, the very last investment which capitalists will make will be in gas stocks. I am heartily in favor of the plan proposed. Manufacturing industries of every character, and even those which produce commodities that are sold the world over, find it necessary to protect themselves against unfair competition by combinations or by pooling. Many representatives of the gas industry were in favor of protecting it by a combination; but the introduction of this simpler plan has resulted in postponement of such action while the practical value of a gas commission is being determined. I believe the Massachusetts example will be imitated in many other States, but that innovation can only be secured through the united effort of the gas men of the several States. I do not believe that the great majority of our legislatures, at least as these are constituted to-day, will give the aid of legislation to our industry without united effort on our part. A copy of the Massachusetts act should be in the possession of every representative of the gas industry of the United States, and frequent conference meetings should be held in the interim of the assembling of the legislatures. If commission measures cannot be passed, certainly self interest ought to prompt us to see that no further oppressive or unjust legislation is placed on the statute books of any of the States in our country. I am heartily in favor of the plan proposed.

Mr. Helme—I note a very strong tendency here to favor the establishment of commissions in all the States, and an apparent impression that our gas associations should play a prominent part in urging this legislation. I am not prepared to endorse the movement solely from the opinion of others, and would suggest we had better move cautiously in the matter, investigating carefully as we pass along. A thought occurred to me during the progress of the discussion that nothing had been said on this point. It was suggested that ten per cent. dividend on a capital based on $10 per thousand of output would be about right. No doubt we would all be glad to get it—in fact I think it is a great deal more than we ever will get. There is, however, this about it. Suppose a company, originally starting in with a small business, prospers to such an extent that after awhile that business is doubled or trebled. Along with that increase of business comes an increase of care and risk. The pipes have to be extended over a greater territory, and the works have to be enlarged. Now, is it the idea of these who are strong advocates of commissions that all this increased care shall be put upon us without any increase in our profit? You say you will get your ten per cent.—and you are not likely to get it—but, if a man's business has doubled, and he only gets ten per cent. on the original outlay, not having been permitted to increase his capital, where is the inducement for us to meet the wants of the public? I think the laborer is worthy of his hire. If we go on and meet the demands of the public, as we very often have to do, by incurring a serious expense with a very small likelihood of return, are we still to be confined to our stated capital; and are we to be tied down to ten per cent. on it, although our money investment has doubled and trebled and our cares heaped up in the same ratio? I would suggest to the gentlemen who so strenuously advocate commissions that when they come to draw the commission bill they had better examine it most carefully in order that they may not overlook some of the points which are a little obscure to us, and which have not been touched upon in the discussion this afternoon.

Mr. Lansden—I think it is desirable to get the sense of the members whether, as an association, we are in favor of gas commissions modeled somewhat after the style of the Massachusetts measure. I offer that as a resolution. (Seconded by several.)

The President—Gentlemen, you have heard the resolution offered.

Mr. Harbison—Before the resolution is adopted which would commit the Association in favor of it I desire to say, in behalf of myself as representing one of the small States to which Mr. Stedman has alluded, that I am not in favor of the passage of such a resolution, if it would be considered as in any degree committing the members of this Association from other States, who do not agree with the spirit of it, to the general approval of such a measure.

The President—I suppose the gentlemen opposed can vote against the resolution.

Mr. Harbison—Yes; but I want to do more than vote against it. I want to state my position with regard to the matter—with the permission of the Association, and without taking too much time. Whereas the gas companies of the State of New York, or of Ohio, or of Massachusetts, or of some or any of the other large States, may consider it advisable or advantageous for them in their respective States to have commissions appointed, I, as representing a gas company in the State of Connecticut, must say I do not think a gas commission is needed for the protection of the interests of gas companies in that State, and particularly is it not needed for the protection of the company which I represent. I have heard no intimation from the managers or representatives of the gas companies in Connecticut that they need a commission there; and hence, as coming from that State, I do not wish to be classed as voting in favor of a commission on general principles. I think we can do a great deal more towards protecting ourselves than a commission could do for us; and if we as gas managers continue (as we have been doing for the past five years) to serve the public by improving the process of manufacture, in improving the quality of the gas, and at the same time reducing its cost to the consumer, and in continuing to grant them the information we have been giving them for the past five years, there will be little work for a commission to perform in any of the States. I do not believe the so-called philanthropists who have been going around the country, and who have been alluded to here, will in such event discover any profitable field wherein to exercise their talents. Where such a course is pursued the "free lances" will have no disposition to seek a quarry, but if they were so minded they will meet with small encouragement from the people, when compared with that they received heretofore, and which the people then perhaps had had good reason for giving them. I think perhaps the gas companies may themselves have been somewhat to blame, and may have left the door open, and may have rather invited competition by their former course. I do not believe any community is yet prepared to permit an opposition gas company to come into its midst to dig up the streets and increase the burden unless a reason exists for it, in the shape that the people have not been able to secure the proper service from the existing company or companies to which they were entitled. That is as far as my knowledge goes, and I have had some acquaintance with the subject. I know, from personal experience, of certain distinguished gentlemen, with plenty of means, who attempted to try the experiment in our vicinity, but, like sensible men, having investigated for themselves, without discovering an "opening" for them there, respectfully withdrew of their own accord. They saw they could not put money in there with any expectation of ever getting the principal back, to say nothing of the interest upon it, and were wise enough to be unwilling to make an investment which promised them no return. I, for one, do not wish to be committed as in favor of a gas commission in our State.

Mr. Littlehales—One very important point which I omitted to urge in favor of a commission is this: We all know very well the calibre of the men who form the common councils of some of our cities, and thus the question is, "In the hands of whom are we the safer? Is it safer to be ruled by a common council three-fourths of whose membership always stand with their hands behind them ready to be 'influenced,' or is it better to be controlled by reputable gentlemen serving as members of a commission appointed by the governors of your States?" It certainly is to be presumed that the commissioners will be men of superior reputation and standing to the average city councilman. I believe that point is well worthy your consideration. It may be that the aldermen of Hartford are all A-1 men, and that the influence of our worthy friend Harbison is sufficient to keep them in order; but we might be pardoned for thinking that, from his high standpoint, he would have looked over a wider range. There are cities in this country where, as the representatives of gas companies tell me, it is impossible to get anything done by the boards of common council. An unfortunate state of affairs, but that it really exists we are forced to believe. If you take the control of these matters out of the hands of such men, and put it in the hands of men of higher grade, are you not far more likely to get justice done you?

Mr. Clark—While I am in full sympathy with the movement for the creation of commissions in the several States, I shall vote against the resolution before us for the reason that I am opposed to this Association endorsing *any* plan for a commission. While it may be well in Massachusetts, it may not do so well in California or Louisiana.

The President—Perhaps we had better read the resolution as it has been drawn up by the Secretary before any further remarks are made upon it. It reads:

"*Resolved*, That it is the opinion of this Association that gas commissions, modeled in general upon that already existing in Massachusetts, would be in most States beneficial both to the public and to gas companies, and that this Association is in favor of their establishment."

Mr. Clark—It would depend somewhat upon the construction put upon the phrase "modeled in general." I think it is rather a dangerous thing to endorse (even as mildly as it is put) the Massachusetts gas commission as being a thing that should be adopted in every State in the Union. As far as we know it does very well in Massachusetts; but perhaps we have not got to the end of it yet. It might not do at all in other States. I think a body like this, representing every State in the Union, had better not endorse that commission. We might find it thrown in our teeth sometime at home when we were struggling for something quite different from the Massachusetts commission.

Mr. Fodell—It seems to me this is a very broad subject we are asked to vote upon and to commit this Association to. The resolution says we are in favor of gas commissions; but that is very indefinite.

Mr. Littlehales—I proposed submitting a resolution worded like this: "That in the opinion of this Association gas commissions, composed of competent men, and selected for the purpose of regulating the differences existing between gas companies and consumers, would, if carried out fairly, be mutually beneficial as well to the gas interest as to the public." I think it practically covers the ground.

Mr. Harbison—It seems to me to be unnecessary to pass any resolution of this kind. The attention of the Association has been called to the subject by Mr. Ramsdell's paper, and by the action of the Ohio Association; therefore I hold that is all the action necessary to enable the representatives of gas companies in each particular State to act for themselves in their States. I do not think it necessary for the members of this Association to put themselves on record as being in favor, upon general principles, of gas commissions. We have listened to a very able and interesting paper on the subject, and we have expressed our individual opinion with regard to it; but I do not think it would be either wise or judicious for this Association to cast its vote in favor of the plan proposed. Having reached home, if the representatives of gas companies in Ohio, Indiana, or any other State choose to move in the matter of securing legislation in their own States in this direction, they have that privilege, and it is their duty to do so. I move that further consideration of the resolution be indefinitely postponed. (Seconded by Mr. Stiness).

The President—The motion to indefinitely postpone is not debatable.

Mr. Helme—I think it is hardly fair to cut off debate in this way.

Mr. Harbison—Then I will withdraw the motion. I do not want to prevent any member from discussing the question.

The President—Mr. Harbison having withdrawn his motion, the original resolution is again before the Convention.

Mr. Pratt—I do not think it is necessary for us to pass any resolution on this question. I shall vote for an indefinite postponement. I hope the original resolution will be withdrawn.

Mr. Harbison, I will change my motion to indefinitely postpone, and move a reference of that resolution to the Executive Committee, with instructions to report upon it next year. (Seconded by Mr. Stiness.)

Mr. Lansden—I merely want to explain why I offered the resolution. I desired to bring the question before this Association as it has been brought before the Western and other Associations. Of course there is nothing judicial in the act, for it is merely a question whether our action here would not strengthen the hands of the State Associations to have the parent Association say what it thinks about it.

Mr. Helme—It seems to me that if anything is finally accomplished it will have to be done through the local Associations. We cannot here attempt to legislate for the whole country. The country is too large, and local conditions vary too greatly. What may answer in one State would not be suitable in another. To my mind the question is this: Can this Association aid the cause by putting itself on record as to whether it is or is not in favor of these commissions? If we are all in favor of a commission in the various States, let us say so; if not, let us say we are not.

The President—The motion now is not as to whether the Association is in favor of a commission, but whether this resolution, which seeks to have the Association express its opinion on the subject, shall be referred to the Executive Committee with instructions to report next year.

Mr. Helme—I think it would have been better to have left it in the original state. If the substitute prevails the matter goes to sleep for a year, and we make no progress.

The motion to refer the resolution to the Executive Committee, with instructions to report thereon at the next meeting, was carried.

On motion of Mr. Greenough a vote of thanks was tendered Mr. Ramsdell.

Report of Committee on President's Address.

Mr. McMillin—The Committee to whom was referred the Address of the President report that, in their judgment, nothing can be added to the value of the address by any comments of the Committee, or by discussing the numerous and valuable suggestions contained therein; and they therefore simply recommend that 700 copies of the address be printed in pamphlet form, and that the Secretary be instructed to mail two copies to each member of the Association.

On motion of Mr. Stiness the report was received and the recommendation adopted.

The Association then adjourned, to reconvene Thursday, October 21, at 10 o'clock A.M.

Second Day—Thursday, Oct. 21—Morning Session.

After order was called the Secretary read a communication from John W. Baker, of Philadelphia, inviting the members to examine a novel gas cooking stove which was in operation in a Sansom street restaurant.

The President then called upon Mr. W. H. Denniston, of Pittsburgh, Pa., who read the following paper, entitled—

SOME FURTHER REMARKS ON NATURAL GAS.

Mr. President and Gentlemen of the Association:—I now appear before you rather reluctantly, but I really could not well refuse the courteous inquiry of our Secretary, who wished to know if I would again favor the Association with something on natural gas, and who also asked if my views on the subject had not changed somewhat from those entertained by me at the time of our meeting in Cincinnati, Ohio, last year. I am neither so modest nor indifferent as not to have re-read my paper and the discussion thereon, on the subject, after these had been printed in the American Gas Light Journal*, but I had been careless enough not to file my copies of the Journal, and upon receipt of the Secretary's last invitation I was, in order to refresh my memory, obliged to send to New York for another number of that publication, which was duly forwarded. Having looked over the opinions then expressed, I do not find that these have changed materially, although I may confess to having since learned something that I did not then know about natural gas. I know now that a good high candle power illuminant can be economically made from the natural gas product. This, no doubt, is what the Secretary referred to when he asked if my views had not undergone some change since our last meeting.

I said last year that I had experimented and succeeded in making—though not continuously so—a good gas; but the success was not attended with material advantage, since the product cost me as much to make as coal gas did. Further, I said because I had failed, and others in the same line had also failed, in making out of it a cheap and good illuminant, that it did not follow someone else would not yet succeed in so doing. Our good friend McMillin emphasized that point. I also said that in any event it behooved those of us interested in coal and coal gas to be on the alert to take advantage of any good thing offered; and in closing my reference I said that even if natural gas were made into a successful illuminant there was no good reason why we, the managers of the coal gas companies, should not be the most responsible and efficient parties to introduce and utilize it, for we had the plant, and could certainly distribute it more cheaply—our services being all in and mains laid—at a less cost than was possible of achievement by new companies, or those especially organized for the purpose.

Now, I am of the "same opinion still" in these respects; and I hold that the coal gas men are to-day in a better position to utilize natural gas for illuminating purposes than are the natural gas men themselves, even with their fuel pipes laid in the same cities and in the same streets occupied by the coal gas mains. That state of affairs will continue as long as the natural product is so abundant, or is to be furnished at a high pressure for such comparatively low prices. If the supply shrinks and the price goes up, then competition may take place, for meters will be put in, and conservation of the vast quantities now actually wasted will begin. Also, when the fuel gas must be furnished at a low pressure a higher price must be charged for the lesser volume, and competition may thus be made possible.

People interested in manufactures and in the locating of manufactories now hardly stop to consider whether or not the present supply of natural gas is to remain with us indefinitely, nor do they care greatly about questioning what it is composed of, or making close scrutiny into the matter of its components' percentage. This one fact is accepted—where it is found in large volume, that place is at once voted a favored locality; and another great victory is accorded it—which bears no relation whatever to the "heat unit" end of the problem—that success in high degree has been attained in the texture, finish—in short, in a real enhanced value of the product of the manufacturer who uses natural gas as a fuel, over the product from the furnace, mill or factory operated by a competitor not so fortunately situated.

Thus what was at first considered problematical or looked upon with

* See Vol. XLIII., Dec. 2, 1885, p. [illegible].

doubt, and, even where permanence was desired, with much theorizing and distrust, is now accepted as a fact beyond questioning. For years natural gas has belched forth without attempt at its utilization being made, and now that it is being so extensively employed, no perceptible diminution (at least in many cases) in the supply volume is noted. Of course, in some districts in which this gas has been found a greater or less decrease in pressure is observed, and perhaps the ordinary methods used for increasing the supply have failed of that purpose—notably so within our own city limits; but I speak as a class of the clearly defined pools or localities where the unusually high pressures have been found. That the flow has been greatly reduced in some places does not make it certain that all will ultimately fail, nor can we argue that these are exceptions to a general rule. Despite all that has been taught and learned on this part of the subject, we are still at sea; but ordinary minds, and men possessed of profound scientific attainments as well, will go on with their studies and theorizing about it, and even these, most likely, so far as we know or care, may but end in theory.

But as gas men—and principally (if not entirely) coal gas men—how does natural gas affect us? Let me reply to you: In more ways than those which simply relate to illuminating gas, and the effect of its operation will extend beyond the limits of the territory in which it is found so abundantly.

A few years ago we were admonished to assiduously cultivate a fuel custom for our gas. We were told how some of our brethren even furnished gas stoves to their customers—"free, gratis, for nothing"—in order to secure a consumption in the hours of daylight. I went into the gas stove business, on behalf of the Company with which I am connected, to a limited extent, too; but, like most others similarly situated, I have not extended or largely developed that particular branch of our industry. Natural gas is now so cheap in Pittsburgh that old-fashioned, wide, open-hearthed fireplaces, with "back logs and fore sticks," are the rage, and highly ornamental "dog irons," with cranes and pots and kettles to match, are becoming quite common. Of course new and fancy as well as useful and ornamental designs are on the market. And here is where the natural gas furore will eventuate in general good to the fraternity. People will become acustomed to the use of gaseous fuel. First using it as a luxury, it soon becomes a necessity (more particularly when applied to manufacturing industries), and its application will be increased and extended all over the country. Then new schemes and ways for the manufacture and utilization of fuel gas will be brought to our attention, and those of us near and remote, as the case may be, from natural gas territory will be benefited. Even those who are right in the territory and, so to speak, surrounded by gas wells, can prosper materially by making the most of their opportunities.

You all know with what doubt, almost amounting to aversion, we coal gas men looked upon the assumption of the water and oil gas processes, and yet we can see how they can be made use of, not to supplant coal gas, but to utilize them in such a way that our output per ton of coal may be increased and the candle power of the gas product be magnified, and thus a benefit be conferred upon the gas companies and their patrons.

The same generous view may be taken in respect to natural gas. It is not impossible (as has been attempted to be demonstrated by coal gas companies) to deliver both fuel gas and lighting gas through one set of mains; but where we have natural gas the consequent cheapness of the fuel—which requires delivery at a higher pressure than for light—would make the separate conduits a convenience, if not a necessity, even if the candle power of natural gas were greater than is generally the case.

That natural gas can be mixed with coal gas, and that it can be enriched with water gas and with naphtha are established facts. We may theorize, talk wise (and otherwise), offer chemical and scientific arguments against the practice, and say that it is not possible to make an illuminant of it; but it has been done. Anyone who wants to, and will take the trouble to investigate the subject, can be satisfied and convinced that it is being done in the East End, Pittsburgh; in Beaver Falls; in Titusville; in Meadville; in Warren; in Franklin; in Oil City, and other places in Pennsylvania. It could not be successfully done by simply retorting it, for I tried that years ago and failed. It is not done by the ordinary mode of carburetting. Passing it through oil or naphtha increases the illuminating power to some extent, but at the same time gives imperfect combustion, and its use in that form imposes on the walls and ceilings an extra covering.

It must be passed through incandescent coals, and enriched at the same time, to make it into a fixed, non-condensable, good illuminating gas—I mean fixed and non-condensable as the terms are applied to other gases. The enricher may consist of crude or refined oil, or any of its products, gasoline, benzine, etc. It can be used without steam; but perhaps to better advantage with it. At any rate, a small amount of steam does no injury. The candle power can be increased or diminished at will. Too rich a gas is neither desirable to the consumer, nor profitable to the manufacturer.

As the candle power of natural gas in our immediate vicinity does not differ much, there need be but little variation from a defined formula for producing the fixed illuminating gas. Even if it did vary the process would be the same, and the enriching material proportions be increased or decreased to accomplish the desired result. The whole plant necessary to put such process in operation, from comparison with a coal gas works of equal manufacturing capacity, is merely nominal, and this is one of the great recommendations. Another and perhaps no less valuable requisite is that if the natural gas should cease to flow or become so scarce as to become comparatively expensive, the very same plant that we have can be used, without any loss of time, and with little additional cost, to manufacture water gas.

Patents upon patents have been issued for carburetters of various kinds; but so far as making a fixed, economical, and, at the same time, satisfactory light to the consumer is concerned, they have been but a delusion and a snare; but this process now in use is all that is claimed for it. As I said before, I do not ask you to take my word for it, or go to theorizing about it. I simply say come and see it in operation. Further, I can say if any of our members or their friends within the natural gas belt wish to try the process, parties can be found who will give a written guarantee it will do all that is claimed for it; if not, the buyer need not lose a cent, for if it does not accomplish all that is asserted, it will be taken down and away at the guarantor's expense.

As intimated a year ago, the area of territory in which natural gas has been found has increased immensely. All over the country—North, South, East and West—there are those who will risk money in boring test wells. The results of this prospecting have been rather curious. In some places, or where the success of the venture seemed almost assured, because in being located on the line or belt, or proper position to tap the anticlinal, or for some other given reason, no gas has been found, sometimes not even a smell; while in other places, or where its presence was looked upon as only possible and not probable, it has been found in greater or less volume—away up in Canada; east of the line of the Westmoreland field in Pennsylvania; South, in Maryland and Virginia; and West, in Ohio, Indiana, Illinois, Kansas, Colorado, California, besides many other places not here enumerated.

Manufactories are tending from other points towards these places. New enterprises are undertaken; vast armies of men, too, seek and find employment. While it is true that changed methods in manufacture threw numbers of men out of employment—particularly coal miners—yet the natural gas development furnishes remunerative employment to a great many laborers, not only in mills and factories, on pipe laying contracts and pipe making, besides the creation and erection of the numerous devices for utilizing this gas, such as furnaces, stoves, heaters, fireplaces, governors, valves, etc.

Now, Mr. President, I am sorry I did not know at an earlier date that I would be called upon again to entertain the brethren, for I might have taken more time in the preparation of this interesting subject, a labor which would have resulted in a more creditable performance upon my part and in greater benefit to the members.

Even last Friday, when attempting to "write my piece," during office interruptious, our honored brother, Mr. Thomas, dropped in on me, and while we had a flow (of words) strong and uninterrupted, it was not all natural gas flow. I was glad of the opportunity to show the works to so competent and yet to such an entirely disinterested critic. I had invited Mr. McElroy out that same day, but he was unable to be present. Mr. Young has been there and knows how the process is working, although the new plant is as yet incomplete.

What has been hurriedly said is not for the purpose of boosting any new patent. It was your Secretary's request, not my seeking. Up to the closing days of last week I did not know what I should say, or how I should say it; and until I received a little slip from Secretary Humphreys giving title to my "piece" I did not know what it would be called. To those who are interested in, or desire to know more about, this subject I will cheerfully give any information at my command; but I do not think it just the proper thing to introduce names of men, or machines, or companies to give them special prominence as against honorable competitors who have no such opportunity. I thank you for your kind attention.

(To be continued.)

SPECIAL ENGLISH CORRESPONDENCE.

COMMUNICATED BY NORTON H. HUMPHRYS.

SALISBURY, Nov. 10, 1886.

An Oil Mania.—A Gas Hammer.—Is a Gas Stove a "Gas Fitting?"—Mr. Lewis T. Wright on the Tar Question.—Gas, Oil, and Coal for Domestic Use.—Regenerative Gas Burners.—A Clever Gas Consumer.

I have noticed that an "oil mania" is not an unknown thing in the United States, and lately we have had occasional symptoms of a peculiar feature possessing some resemblance to this disease. These have been specially prevalent among certain members of the local authorities of small towns, and

take the form of a firm belief that oil is capable of being used as a medium for public lighting in a manner that will render it not only much cheaper, but much more efficient and satisfactory in every way than any other known means of artificial illumination. After making inquiry of the inhabitants of towns where oil lighting has been tried—and it is to be presumed that gentlemen occupying public positions have every opportunity of doing this—such a belief may well be regarded as a remarkable hallucination. I don't say that there are no oil lamps in the market suitable for outdoor purposes, and capable of giving a good illuminating duty with a moderate consumption of oil. The lamps certainly answer well when exhibited in the board room, or put up as specimens in some public place by the makers; but when handed over to the contractors it rarely happens that matters proceed without complaint. The wicks, glass chimneys, etc., require a great deal of attention, and some of the lamps go out, or are extinguished by wind, while others fail for lack of oil. In one town I hear of, by the way, the latter defect is entirely absent; for the complaint has been made that the oil trickles down the lamp posts. This result, if unpleasant for passersby, or for the convivial individuals who find lamp posts very convenient, at any rate shows that the contractor supplies his illuminant without stint. At this time of the year the question of the renewal of street lighting contracts usually crops up; and when this is discussed it is becoming quite a general thing for one member of the board to deliver quite a panegyric upon oil lamps, after which the tender of the gas company is usually returned for further consideration. If a satisfactory reduction in terms is not forthcoming, then experiments with the oil lamps are made, or possibly a twelvemonth's contract is entered upon.

An interesting novelty in the way of gas appliances is the Robson gas hammer, as manufactured by Messrs. Tangye, of Birmingham. This machine shares all the advantages of the gas engine as compared with the steam engine, and is very portable and cheap. It can, of course, be made to furnish any desired power or speed, but the one exhibited is capable of giving 110 blows per minute. The consumption of gas is directly proportioned to the number and force of the blows, and it has been proved by extended practical tests that from 75 to 135 blows are given for each foot of gas used. The operator has full control over the speed and force, so that he can increase or diminish the weight of the blows, or miss a blow if desired. The makers claim not only that the appliance may be used in shops where steam is not obtainable, but that, with gas at the prices usual in large towns, it may be introduced as an economical substitute. The apparatus possesses some resemblance to a steam hammer in appearance, and is operated by one man, who grasps a lever for starting or stopping in one hand, and turns a wheel for regulating the force of the blows with the other.

An action recently decided before the High Court of Justice is of great importance and interest to all gas companies who supply stoves or fittings on hire. The defendants had seized a gas stove under a distress for rent, the stove having been hired by the defaulting tenant from the gas company in the usual way; and persisted in selling it, notwithstanding due notice being served upon them. Therefore the action was brought to recover the value of the stove. The counsel for the gas company having shown that they were empowered by their act of Parliament to let on hire meters and fittings, and to make special terms with the consumer for securing return of the same, and protection against distress, the defendant's counsel raised the point that "a gas stove was something more than a gas fitting." The term "fitting," it was contended, should be confined to something which either conveyed or was used for the actual burning of the gas, and a gas stove was not "a mere apparatus for receiving and burning the gas." In reply the plaintiff's counsel urged that the obvious intention of the act of Parliament was that the property of the company, lent for the accommodation of the consumer, should be secured against seizure under distress. In delivering judgment Justice Stephen pointed out that the term "gas fitting" must be taken in a broad sense and in a manner that would work conveniently in practice. He considered that it included not only pipes and burners, but all necessary accessories. It would be impossible in practice to have the burners only free from distress and the other parts of the stove liable. Looking at the stove, he thought that the whole of parts were intended to be used substantially for gas cooking, and would indeed be useless without the gas; therefore the stove was a gas fitting as contemplated by the act, and he gave a verdict for the gas company, with costs.

The announcement that Mr. Lewis T. Wright would read a paper entitled, "What shall We do with Our Tar?" at a meeting of the Society of Chemical Industry (London section), on last Monday week, served to draw together not only a large number of the members, but also of gas people. The latter attended probably because Mr. Wright has given the Society some interesting papers on former occasions, and the question of liquid fuel is now attracting considerable interest. The latter were attracted by the fact that, as the manager of the Nottingham Corporation Gas Department, having several large gas works under his care, Mr. Wright would have had ample opportunity for acquiring practical information on this interesting point; and because they knew that he would not have accepted the published information, or theoretical calculations only, as the data for his remarks, but would have worked experimentally at the subject himself. Nor was anyone disappointed with the paper. After a brief history of the tar market during the past few years, an estimate of the annual production of tar, etc., the author proceeded to discuss the possibility of influencing the production of tar by the method of working usual at gas works. It had been suggested that by working at higher heats, the production of tar would be decreased to the extent of 30 per cent. or so; but Mr. Wright observed that at present the highest temperature of distillation that was compatible with practicable conditions was the general rule, and his experiments, at a forced degree of temperature, showed that there was little prospect of reducing the yield of tar in this manner. The results of several experiments made with virgin tar, and also with several of its constituents, with a view of ascertaining the practicability of utilizing the same, either for the production or for the enrichment of illuminating gas, were quoted. These showed that, even at the present low prices of tar products, it was impossible to derive any advantage from them, as compared with coal, in this direction; and as for the crude tar, it was "dear at a gift." Several details of practical experiments with tar and creosote were next entered upon; from which it appeared that the full value of tar, as compared with coke, is as five to four. After this the question of economy—when it would pay to sell rather than to use the tar as fuel—was considered, and a rule for ascertaining the fuel value of tar at any particular works was formulated. Mr. Wright thought that every gas works manager should decide for himself which was the cheapest fuel—tar or coke—and act accordingly. After the paper there was a long discussion in which several gas engineers took part. Mr. Wright was thanked for his experiments, and there was a general agreement with the views he advanced.

Mr. W. Ivison Macadam has presented an interesting communication to the Scottish Society of Arts, detailing the results of an elaborate series of experiments with gas, oil, and coal as used for heating, cooking, and domestic purposes generally, dealing with the question in a complete and exhaustive manner, and including points such as the chemical constitution of the various fuels, the products of combustion, etc. The details of construction, as regards the stoves, burners, etc., used for the trials were also fully entered upon. And a special feature of the experiments is that they were not tried in the laboratory under special circumstances, but conducted in the kitchen by a plain cook, and therefore under usual household conditions. Weight for weight it was found that coal gas stood first as a heating agent, then oil, and lastly coals of various kinds. The facts already known with regard to gas cooking, such as economy, efficiency, the saving in weight of meat roasted, etc., are fully substantiated by these experiments. Talking of heating by gas reminds me that several of our leading gas stove makers have favored me with copies of their new season's catalogues, and that a special feature this year is the improvements in heating stoves of the asbestos fiber type. Each maker, I see, is running several new designs. The activity prevailing in the gas stove business, both as regards heating and cooking apparatus, is a satisfactory feature as tending to the increased consumption of gas.

So far as one may judge by the official patent lists, inventors have been remarkably busy on the subject of regenerative gas burners lately, chiefly those of the inverted type. I do not notice any new departure in principle, the novelties consisting mainly of structural details directed towards the simplifying of this class of apparatus. One or two designs, however, are noticeable as applying to ordinary globes and fittings. The inverted light has come so much into use, notwithstanding the fact that it requires special fittings, that a simple and reasonably cheap burner attachable to any ordinary pendant or bracket would be sure to meet with a good demand if introduced into the market.

Mr. Emanuel, jeweler, Portsea, appears to have mistaken his vocation in life. He ought to have been a barrister. Lately he was summoned by the Portsea Gas Company, at the County Court, for an account due for gas, which he disputed as excessive. By some extraordinary oversight the Company had omitted to have the meter in dispute tested as provided by their act, and therefore Mr. Emanuel was in the position of being able to walk over the ground. But instead of simply urging this defence, he delivered a long oration, the greater part of which had no bearing upon the points at issue. Having dealt exhaustively with the whole history of the case, and the law bearing upon it, he proceeded to give reasons for supposing that gas meters are occasionally subject to "some subtle and capricious influence." The "reasons" consisted of a letter from somebody in Dublin setting forth that it was possible to force air through the meters while *in situ*, the said air being, of course, measured and charged for as gas. After this he reflected at some length on the policy of the gas company in regard to large consumers, the quality of their gas, etc., and other points. He then stated that he had had the meter tested for his own satisfaction by the Corporation Official, but he could scarcely recognize the certificate as valid, *because it emanated from a municipal body who were about to spend* £120,000 *on offices*. The reason why such an amount of latitude was allowed to a non-professional man in a law court has not transpired.

Notes from the West.

By Retort.

November, 1896.

Those of us who have been in the business—wheel-horses, as it were—"lo! these many years," will remember with what startling effect the Johnson patent of 1886 was made known to the world in general, and how it revolutionized the gas world in particular. Truly, it was a remarkable discovery, bringing as it did the cost of gas in the holder from 50 or 60 cents per thousand cubic feet down to 2 cents, thus making it even cheaper than the natural gas then so largely used. With what consternation this marvelous change overwhelmed us! It seemed as if our industry was to be ruined; but "time worked wonders," and the threatening disaster became our best ally.

To-day we are upon the eve of another discovery as wonderful and as pregnant with grand results as was the other—when it becomes known. The first was heralded to the world through the columns of the secular press; but your correspondent has been fortunate enough to procure for you an exclusive copy of this startling discovery! For the benefit of the younger members of the fraternity I give below the original dispatch concerning the former (the Johnson) patent, which will help to explain the new invention, and which will also be found, even at this late day, "mighty interestin' readin'."

"CHEAPER THAN DAYLIGHT!—Important Invention in the Manufacture of Gas.—Making Half a Million Cubic Feet from a Barrel of Oil, that is Still Worth the Cost Price.—Associated Press Special Dispatch.

"Canton, Ohio, November 19, 1886.—There is important news here to-day, which is corroborated, of a gas-making process that promises to outdo natural gas. The news comes in response to an inquiry to Mr. W. B. Sutler, neighbor of the inventor, Mr. J. J. Johnson, of Columbiana, Ohio. Mr. W. B. Sutler is a prominent manufacturer of that place. Mr. Sutler replies to a letter addressed him by a Canton business man, and says Johnson has been working on the invention for some time, and has succeeded in perfecting his process to such an extent that wonderful results have been accomplished.

"The principle of the machine is a system of syphons, and air is forced alternately through water and through oil, resulting in gas. The tests made by Mr. Johnson on the machine first finished by him resulted in getting 450,000 cubic feet of gas from a barrel of oil. After this immense quantity of gas had been made the residue of oil as a lubricator is said to be worth as much as the barrel of oil originally. It is cheaper than daylight, for after getting the light and fuel you have the original value of the material you got it from.

"Mr. Johnson made a trip to Boston, and had a conference with capitalists regarding the sale of the right to the invention. After his representations chemists from Harvard College were sent to Columbiana to investigate. They reported favorably on it, and Johnson was given a million dollars for the right in the United States, with the exception of Pennsylvania, Ohio, Indiana, and Illinois. Later he sold the right to these four States, with the exception of Columbiana county, to a Pittsburgh syndicate for half a million dollars. The men from Boston who examined the machine said that when perfected no doubt a million feet of gas could be produced from a barrel of oil.

"As an illuminant it is said to be far superior to the gas manufactured under the ordinary process, and as a fuel it is vastly better than natural gas. Its heat is intense. A bar of lead was thrust into the blaze and immediately fell apart. From a pipe which issues from Johnson's laboratory issues a blaze eight feet long that makes an intensely brilliant light. When knowledge of the invention gets abroad it is expected to create a wonderful sensation. As it is expected to completely revolutionize the matter of lighting and fuel, the parties who have gained control of the invention have been endeavoring to keep it quiet until they were ready to begin operations."

Now for the developments of to-day:

ANOTHER WONDERFUL DISCOVERY!

Marvelously Cheapening the Cost of Illuminating Gas.

Special to the American Gas Light Journal.

Canton, Ill., November 19, 1896.—An astonishing and most important discovery has just been made by Johnson Jayjay, of Columbiana, Green county, Illinois, and we are enabled to wire you of it through the courtesy of S. W. Butler, Esq., of this place.

It will be remembered that about ten years ago J. J. Johnson discovered the startling secret of so combining air, water and oil as to convert one barrel of the latter into 450,000 cubic feet of 18 candle power gas. That is the Johnson patent, now so universally recognized and used. By the Johnson process gas costs from one to two cents per thousand placed in the holder—the cost varying according to price of oil, quantity manufactured, etc. While this was acknowledged to be very cheap, and hushed for a time the complaints then so numerous against the "gas monopolies," the public again became restless, and their outcries set our inventors at work with increased vigor. Their investigations have resulted in the invention of a process for manufacturing *the oil* so cheaply as to make the cost of gas per million cubic feet $1, as against $20 under the Johnson process. More than this, the residuum is worth more than the cost of the original ingredients, *including the barrel!*

The principle followed is in accordance with well-known chemical laws, and is about as follows: A 50-gallon barrel, hung on trunnions, is filled "nearly full" with water (H_2O), to which is added a certain quantity of sulphur (S), forming H_2SO. The point now is to change this into H_2SO_4—or kerosene oil—by adding O_4. This is done in a very ingenious manner (it is the basis of the patentee's claim), and is accomplished thuswise:

Into a suitable opening in the head of the cask is poured a proper quantity of black oxide of iron (Fe_3O_4), which is caused, as soon as it reaches the lower head, to again pass through the entire mass of H_2SO by simply reversing the barrel "end for end" on its trunnions. This is repeated until the Fe_3 is liberated from the O_4, and, by extracting the former and allowing none of the latter to escape, we then have the chemical compound H_2SO_4, or petroleum!

Strange to say, as soon as the Fe_3 reaches the atmosphere it is found to undergo a chemical change—the reunion of the oxygen in the atmosphere converting it into the finest crucible or open-hearth steel; while upon the opposite head of the cask is deposited a white powder, which was subsequently discovered to be Rochelle salt, and which material is used as a basis for seidlitz powders. These two "articles" readily bring in a cash return greater than that expended in the purchase of the original ingredients, including, as before, the price of the cask!

It is reported that the Standard Oil Company have offered $50,000,000 for the patent; but Mr. Jayjay asks nearly double that sum. The oil is odorless, decolorized, and non-explosive. Used in the ordinary lamp it is very much superior to natural oil; while, when converted into gas, it increases the yield from 450,000 cubic feet per barrel to 550,000 cubic feet, and the candle power of the product jumps from 18 to 28. The specific gravity of each is equal.

As soon as this is published another change will have to take place in our plans for manufacturing gas. The secret was to have been kept; but your correspondent discovered it through the negotiations of the Standard Oil Company.

In gas manufacture all that now remains undone is to perfect an automatic apparatus to supersede manual labor. This matter is in the hands of Mr. Keely, of motor fame, which guarantees its success and means "only a question of time!"

ITEMS OF INTEREST FROM VARIOUS LOCALITIES.

Welcome Home.—Mr. William N. Milsted, Gen. Supt. of the American Meter Company, arrived in New York, per steamship Arizona, on November 15th. His trip to England, which took up about two months, has convinced him that our English *confreres* are far ahead of us in the matter of efficient street illumination by gas. Liverpool, London, Leeds, and Bradford, he asserts, have accomplished marvels in that direction; and he also noted that electricity was chiefly conspicuous through its absence from these busy marts. The genial voyager looks well and hearty, and is in fine trim to resume the duties connected with the West Twenty-second street establishment.

Bon Voyage.—Mr. E. Stein, President of the Siemens-Lungren Company, Phila., Pa., will sail for Europe, per steamship Etruria, on date of December 4th. Mr. Stein intends to push the matter of the introduction of the Lungren lamp in Europe with his accustomed energy, and will remain abroad about two months. It might be added that Mr. W. J. Wilson, whose apt response to the toastmaster's call upon him at the banquet of the American Association in Philadelphia, last October, is sure to be pleasantly remembered by those present on that occasion, takes passage on the same steamer. Mr. Wilson, who is connected with the house of James and William Wood, a firm extensively engaged in the mining and shipment of English cannel coals, will revisit America shortly. We wish the voyagers a safe and speedy conveyance.

Kerosene Oil and Diphtheria.—Some few years ago many of the gas engineers and physicians of this country earnestly discussed the subject of the probability that the use of kerosene oil as an agent for domestic lighting might be in some degree connected with the propagation and spread of that miserable disease, diphtheria. Notwithstanding the fact that the users of kerosene, as a rule, laughed at the discussion as ridiculous, those who supported the theory were convinced of the soundness of their assertions, since the testimony collected appeared to substantiate the claims advanced, al-

though it cannot be said that many converts were thereby made. Recently attempts were instituted to renew the discussion, and Dr. Wilson, of Meriden, Conn., in a letter to the New Haven *Register*, submits the following rather startling evidence in support of the affirmative side of the proposition. The Doctor says: "There were 71 deaths from diphtheria in the town of Meriden in one year, and by personal investigation I found that in every case the family used kerosene lamps. There were many other cases in Meriden that year—the spread of the disease being from contagion—but not in a single instance where gas or candles were used was there a case of that disease which terminated fatally." This would indeed seem to be more than a mere coincidence.

Joint Gas and Electric Light Supply.—The corporate titles of the Marblehead and Dedham and Hyde Park (Mass.) Gas Companies have been amended by the addition of the words, "electric light," so that these now read, "Gas and Electric Light Companies." It will be remembered that Mr. W. Eliot Fette, who is largely interested in the above named enterprises, received legislative sanction for such increase in their corporate scope from the last assemblage of the Massachusetts lawmakers. Stock certificate books, worded to meet the new conditions, are now being prepared, and when these are ready the old shares are to be called in and replaced by the new ones. In his note to us on the subject Mr. Fette says: "We, as yet (Nov. 23), are doing no electric lighting at Marblehead or Dedham, but have advertised to do so when we have secured a sufficient number of applications for the lights. In this way we occupy the ground as against outsiders who have no special authority from the Legislature, and can, with some chance of success, oppose the entrance of others until the towns have proved that there is room for *two* electric light companies. If there is any money in the business we ought surely to be as well able to make it as anybody—we having surplus steam and surplus fuel—and certainly the possession of enlarged powers is no detriment to their possessors. It is gratifying to me to see so many companies following the path indicated by me. I presume the final result will be the passage of a *general law* by the State of Massachusetts permitting gas companies to supply electric light." The managers of the South Boston Gas Company (Mr. Fette has been one of its board of directors since 1875) will apply to the legislature for powers similar to those above noted, and it is also understood that Brookline, Chelsea, Clinton and Roxbury will follow suit. There can be no gainsaying the fact that New England's gas managers are inclined to favor the conjoint operation of gas and electric plants; and it is equally certain that the inclination to do so constantly becomes stronger. It is curious, however, to note one revolution that has occurred in the prevailing sentiment. Formerly the incandescent system was regarded as being the system most likely to come into competition with gas, but the reverse now appears to be the case. Arc street lighting seems to tickle the taxpayer's fancy, even if it does diminish the size of his bank account, in that it increases the tax levy; but here comes the danger. His liability to be tickled is only exceeded by his penchant for fickleness, and who can vouch that, having been tickled to his heart's content—said "content" being liable to occur at any moment—he will at once seek diversion from monotony in a lengthy innings of fickleness.

Where Some of the Providence (R. I.) Gas Company's Coke Goes.—It is quite the fashion for "advance agents" of the down-with-the-monopolists class of shriekers to style all well-managed corporate business enterprises as entirely devoid of soul. Strictly speaking no doubt the shriekers are right, as far as the enterprises are concerned, but it is presumed they would have us infer that those interested in the enterprises are also soulless, a conclusion or inference which requires the drawer thereof to be possessed of a peculiarly facile imagination. Now, we know that gas companies are held to be soulless in a marked degree, and more's the pity; but nevertheless we venture to assert that not a single coal gas man in this country exists who has not, with the passage of each year, contributed something towards the alleviation or the amelioration of the distress of the poor of his locality. In all communities will be found organized bodies who seek out those cases worthy of relief, and the local gas man is never appealed to in vain to lend a helping hand. Take, for instance, the work of the Providence Gas Light Company in this respect, whose managers every year deliver, free of charge, 100 chaldrons of coke, to be distributed by the Providence Charitable Fuel Society, to the needy inhabitants of their city. Coke is worth about $3.50 per chaldron in the former bailiwick of Roger Williams, and its action means a loss of $350 per annum to the cash account of the Providence Gas Company. Gas corporations may not have souls, but they seem to possess a pretty good substitute therefor in the shape of automatic charitable impulse.

Ho for the Breckenridge Cannel!—This celebrated Kentucky colliery, which is once more freely yielding up its wealth of rich cannel coal, is now in thorough working order. The daily receipts at mouth of pits are about 150 tons per day, and that output will speedily be increased to 200 tons. Messrs. Perkins & Company are sole agents for the sale of Breckenridge cannel in the United States, Canada, and Mexico.

Street Lighting at Buffalo, N. Y.—The bids for street lighting in Buffalo for ensuing year, as presented to the comptroller by the various bidders, disclose the fact that the three gas companies, in their respective districts, propose to furnish gas to the lamps and to public buildings at the rate of $1.40 per thousand cubic feet. The Brush Electric Light Company, and the United States Electric Light and Power Company agree to maintain the arcs now kept up by them at a charge of 50 cents each per night. Under the old contract the gas companies receive $1.50 per thousand cubic feet, and the electric purveyors 55 cents per arc per night. On November first the city maintained 6,721 gas lamps, equipped with burners rated to consume four cubic feet per hour, and kept in duty in accordance with a schedule covering 3,814½ hours per annum. It is, therefore, seen that Buffalo absorbed 102.55 millions cubic feet of gas in the street lamps last year; but it is likely that in December, January and February of this and future seasons the street lamp schedule will be increased by a total of 45 hours, or one-half hour to each evening. If this plan is followed the actual saving, in consideration of the ten cent. reduction, will be $8,561.21. If the half-hour extension be not made the reduction will result in a saving to the municipality of $10,254.90 per annum. Buffalo, on Nov. 1st had 546 electric lights, and the reduced rate on these means a saving to the municipality of something less than $10,000 per annum. The street lamp schedule now calls for their extinguishment—in January, at 6:20 A.M.; February, at 5:50 A.M.; December, at 6:20 A.M. The agitators of the 30 minute extension in those months base their argument for the change upon the ground that working men who are obliged to get out pretty early if they would reach their factories, etc., on time, would be the ones most greatly benefited; for it is proposed the extension of the burning limit will be made on the morning hours.

Started in.—The electric lighting company of Morristown, N. J., commenced to supply electricity in a small way to the residents of that section on the evening of November 15th. Its advent does not seem to have attracted much attention or aroused much interest, judging from the fact that the local papers dismissed the inauguration through the medium of "five-line" paragraphs. It is reported that, after weeks of canvassing, less than 50 lights are in circuit.

Cheap Gas for Massillon, Ohio.—Mr. Alfred Hopper, Secretary and Superintendent of the Massillon Gas Light Company, informs us that all gas consumed from date of November 1st will be charged for at an all round net rate of $1.50 per thousand cu. ft. This reduction was made from the former schedule given below:

Under 3,000 cu. ft. per month	$2.25 per M.
Between 4,000 and 10,000 cu. ft. per month	2.00 "
Over 10,000 cu. ft. per month	1.80 "

That schedule became operative on first day of current year, prior to which date an all round rate of $2.50 per thousand was charged. Now, although we have no positive advices in support of the opinion, it seems to us as if the Massillon folks must have had pretty good proof on their books that cheap gas means better business and greater safety. Massillon is growing rapidly, and the local gas company certainly keeps step to the march.

Gas Rates at Elmira, N. Y.—The net rates at present charged by the Elmira Gas and Illuminating Company are as follows:

Bills rendered showing monthly consumption in value of				$25...$1.80 per M.
"	"	"	"	$25 to 50... 1.75 "
"	"	"	"	over 50... 1.70 "

Gas supplied to public lamps is charged for at the rate of $1.70 per thousand.

Death of the Hon John Arnot, Jr.—Advices from Elmira, N. Y., dated Nov. 20th, brought the sad news of the decease, on that day, of the Hon. John Arnot, Jr., who for years had been one of the controlling spirits of the Elmira Gas Light Company—as matter of fact he was President of that corporation, until the reorganization of its affairs last summer, when the company took on the appellation "Elmira Gas and Illuminating Company." Deceased received severe injuries through an explosion of illuminating gas that occurred in one of the vaults of the Chemung Canal Bank (this accident was noted in the Journal shortly after the time of happening), and he never thoroughly recovered from the state of nervous prostration into which he was thrown by the shock, No man in that portion of the Empire State was better known and respected than was the deceased national legislator who forms the subject of these few lines. Honest and charitable, he will be mourned sincerely by those who were his coadjutors in business or who reaped of his bounty. Deceased was chosen President of Elmira in its village days of 1859-'60-'61; became its mayor in the more opulent days of Elmira's elevation to cityhood, serving as such in '64, '70, and '74. In 1882

his fellow citizens selected him to represent them in Congress, returning him again, almost without opposition, in '84. A wife and three children survive him. Deceased was committed to earth on the afternoon of Monday, November 22d.

In Completion.—In order to complete the reference to the Elmira Company's reorganization it should be said that the late Jno. Arnot, Jr., was succeeded in the Presidency of that corporation by Mr. Chas. J. Langdon; Mr. M. H. Arnot being named as Treasurer.

Mr. Emerson McMillin and the Chicago "Sanitary News."—The *Sanitary News*, published in Chicago, Ills., in its issue of November 6th indulged in a display of bile concerning the Philadelphia meeting of the American Gas Light Association. The *News*' statements were fully as ridiculous as any ever made in the columns of the daily press, which is passing strange, in that gas men might naturally expect to receive something like fair play from an organ supposed to be a teacher of advanced ideas. Mr. Emerson McMillin, in a letter published in the 13th of November issue of the *News*, takes the latter sharply to task for its ridiculous tirade; and our readers may be certain that "Mac.," with his accustomed thoroughness, probed the opinions of the *News*' scribbler with a pretty sharp pen. Lack of space alone prevents us from reproducing the rejoinder and its inciting cause.

Street Lighting at Marshalltown, Iowa.—Mr. C. D. Shreve, the lessee of the Marshalltown gas works, has had a lively time with the City Council and sundry electricians over the matter of the public lighting of the borough for the ensuing year. Despite the inclination of certain councilmen to "deliver" the contract to the manipulators of the arc system it was finally determined to entrust Mr. Shreve with the undertaking, under the following general terms: The Marshalltown Gas Company to keep up for one year the full quota of "all night" and "midnight" lamps at the submitted contract prices—$28 and $30 per annum respectively—the first named description to be maintained in accordance with a moon-table, "provided nothing in this contract shall prevent the cancellation of it by the city at any time when the city, in its own corporate capacity, shall furnish, own and operate its own electric light plant; provided further, that the city reserve the right to cancel at any time that part of the contract relative to the lighting of Third avenue and Main street, and substitute electric light on such terms as may be made for the best interests of the city, the city to be at the expense of putting in repair the city's posts." The result of the affair is looked upon as a victory for Mr. Shreve; for, as we understand it, Marshalltown during the past year has been lit by electricity, as to its streets, either partially or completely; yet we are not certain about it. In any event Third avenue and Main street will now probably be lighted by electricity, gas doing the rest of the work. Judging from the lengthy, ludicrous and loud discussion by the councilmen some of those worthies are inclined to cause the city to purchase and operate an electric plant on its own account; and if Marshalltown's taxpayers do not desire to pay for the privilege of possessing an elephant of unpleasantly huge proportion they had better instruct their city fathers to cease coquetting with the "advance agents" representing "home manufacturers" who are anxious to sell dynamos, and the like, but who are averse to putting in plants and operating the same, or of taking the chance of meeting with success or failure on an ordinary mercantile basis.

Cheaper Gas for Eureka, Cal.—The proprietors of the Eureka Gas Company, of Eureka, Humboldt county, California, have expended a considerable sum of money during the past summer months on plant improvement. The retort house benches were remodeled and enlarged, the condensing apparatus perfected, and the purifiers were reconstructed and their capacity added to. Having secured and made perfect their manufacturing facilities the managers next turned attention to the consumers end of the line in the shape of announcing that from and after November 10th a uniform rate of $3 per thousand cubic feet would be charged for gas supplied. That may seem to be a pretty stiff price, but nevertheless it is 25 per cent. lower than that formerly charged. Due heed being given to the attendant circumstances the new figure is about equal to a tariff of $2 in this vicinity. The Eureka folks evidently mean to "grow and spread," even if they are at the other end of the continent. The ruling price for gas, for instance, at Oakland, California, where a pretty extensive plant is located, and which does a really thriving business, is $2.75, and that rate only became operative in March, 1886.

The All-Knowing(?) Press.—Some one or other of the cowboy members of the editorial staff of that wild western idea and sample of erratic journalism in the Metropolis, yclept "*The New York World*," sent down (or up) to the composing room one dusky evening in November the following compilation of thoughts that breathe, etc.: "The Standard Gas Light Company has increased its capital stock to $10,000,000, and proposes now to enter the field in this city as the manufacturer of a cheap patent gas. The public will enjoy the discomfiture of the old gas corporations, and will rejoice when gas tumbles from $1.75 to $1.25 per thousand. The fresh ripping up of the city will be a nuisance, of course, but a little more competition in the illuminating line will not be objected to, provided the municipality is fairly dealt with." If the "brainy" genius would only indulge himself for a second or two in a "fresh ripping up" of one or two of his neighbors' gas bills—for such vouchers would seem to be scarce in the sacred precincts of the *World* building—he might be able to join in the "rejoice" which they have been enjoying since last June. The brainy cowboy is evidently not to be trusted outside the corral within whose barbed wire boundaries he gathers together that wonderful medley of queer and often filthy advertising which his employers have the assurance to call a newspaper.

Hannibal, Mo., Keeps Finding Fault with the Electric Light.—A recent issue of the Hannibal *Evening Post* says: "It is our candid opinion that the much talked of and overrated electric light is not a success, and therefore not satisfactory to the citizens of Hannibal. Whether it is the fault of the dynamos, the engines, the engineer, or the carbons we know not; but we do know that we are having very poor and unsteady lights. The amount required to light the city with electric light for a year, if expended for gas, would give us a much better illumination." The simple truth, beyond a doubt.

Street Lighting at Memphis, Tenn.—On November 18 bids for lighting the city of Memphis were submitted to the City Council. The Memphis Gas Light Company handed in the following: 1. Exclusive of ordinary repairs, also of lighting, extinguishing, and cleaning, the keeping of the burners in action to be charged for at the rate of $1.25 each per month. 2. For the same service, but including the specific matters omitted in first proposition, the rate of $1.75 per post per month was to be paid. Both bids were based on the moon table hitherto in use. The propositions were referred to the President of Council, who was instructed to report a contract back to the City Fathers for their subsequent ratification. Bids were also submitted by the Thomson-Houston and Brush Electric Lighting Companies. The former offered to furnish from 1 to 30 (two-thousand candle power) lights at a charge of $18 per month each; upward of 30 but not below 40 lights, the charge was to be $16 each per month. The Brush folks made a similar offer, except that they agreed to supply any number of lights in excess of 30 at the $16 rate. The electric bids were referred to the "President of the Taxing District," with power to act. Memphis is a busy place—at least so visitors from that vicinity affirm.

A Line or Two from Stamford, Conn.—The Stamford authorities have been coquetting with the electricians in control of the local Schuyler Company, and as a result the latter are now supplying 20 arcs to the municipality. For each of these the city pays $115 per annum, and they cease to shine at midnight. The illuminating power of the Schuyler sample operated in Stamford is placed at 1,000 candles. One queer feature of the Stamford public lighting, or rather the new phase thereof, is that whereas before the advent of the 20 "little Schuylers" none of the street gas lamps were alight after 12 o'clock, now those which were displaced by the aforesaid 20 are lighted as soon as the arcs are shut off, and remain alight until daybreak. Of course, Messrs. Gay and Miller, of the Stamford Gas Company, are not likely to object to that policy; why should they, indeed? It might be here said that the 20 arcs displaced—partially or half displaced would be nearer the mark—40 gas lamps. The Schuyler Company, upon starting its business, began with a total of 50 private lights—July 1, we think, witnessed the "start"—and 13 of these were cut off from the circuit up to November 1. Were it not for the fact that six-month contracts had been entered into by many of the users, the single baker's dozen of secessionists would by this time be perhaps doubled. The charge made for each arc to ordinary or domestic users is $12 per month, the service being withdrawn at 11 P.M. The total number of public gas lamps now in use by the municipality is 200; but on November 15 Superintendent Miller commenced the task of putting down some 3,000 feet of services, all intended for new street lamp connections. A short visit to Stamford, made not a great while ago, convinced us that the Stamford Gas Company is sadly deficient in the item of storage capacity. The judicious expenditure of a few thousand dollars would greatly improve the Company's position, which, while at present beyond doubt in excellent condition (in the matter of financial returns on the capital invested), is of course a matter solely belonging to its proprietors.

This Contract is Likely to be Kept.—In our issue of September 16 we had occasion to make editorial comment on two proposed breaches of contract that were contemplated respectively by the municipal authorities of Saginaw, Mich., and Appleton, Wis. The Gas Companies at each of these places operated under charters which guaranteed their possessors the exclusive right to light the city for a specified number of years. The Saginaw

Company's right was supposed to extend for 30 years from the first of 1868; but the city authorities, in August, 1886, sought to abrogate or nullify the plain provision of the Company's charter, in order that they might hand the public lighting over to an electric company. We do not know how the matter was finally settled, but we do know that the initial legal proceedings seemed to be all in favor of sustaining the authorities in their attempts to compass the proposed breach. The owners of the Appleton (Wis.) Gas Company act under a charter granted in 1878, which authorizes and empowers the possessors to solely perform the work of lighting the city's streets until 1893. Here, as in Saginaw city, the latest aim of the authorities was to commit the public lighting to the hands of the electricians; but, we are glad to say, wise counsel finally prevailed, although a determination to desist was not reached until after a contract with the electricians had been made. However, "all's well that ends well;" and the electric lighting contract has been rescinded on the ground that the same could not be lawfully entered into—a decision which really should not have absorbed such a length of time and waste of talk.

Explosion of Fuel Gas.—Shortly after noon of November 16th a sharp explosion took place in the alley at the rear of the Troy (N. Y.) City Hall building. Investigation showed that the trouble was caused by a defect in one of the supply pipes of the Troy Fuel Gas Company.

Cheaper Gas for Cleveland, Ohio.—From and after the first of the new year the lucky consumers of Cleveland, Ohio, will be called upon to pay only $1.25 per thousand cubic feet for their gas supply. This announcement is made on the authority of Mr. J. H. Morley, President of the old Cleveland Gas Company, backed up by that of Mr. G. H. Warmington, of the Peoples Company. The following schedule shows the rates charged for gas supplied to ordinary users by the old Company during the past 18 years: Prior to 1868, $3; Jan. 1, 1868, $2.50; Sept. 1, 1875, $2; July 1, 1880, $1.80; Jan. 1, 1881, $1.65; Sept. 1, 1883, $1.50; Sept. 1, 1884; $1.40. Prior to Sept. 1, 1885, the price to the city was $1.25; but since that date the city has paid but $1. These are eloquent figures, and the later-day ones carry convincing proof that those who succeeded the late Mr. Price—whose memory is yet dearly cherished by those of the fraternity who were coeval with him—are firm, practical believers in the policy which he so often advocated.

Not to Shine After New Year's Day.—At a special meeting of the directors of the Chicago Board of Trade, held Nov. 15, it was determined to cease paying for the tower lights (electric) now ornamenting (or disfiguring) the handsome Board of Trade Buildings. This will save a worse than useless annual expenditure of $2,500. We wonder why the step was not taken long ago.

Appointed Superintendent.—Mr. Jas. H. Walker, Sr., has been appointed Superintendent of the Gas Company at Tonawanda, N. Y.

Destruction of a Gasholder.—On November 19th the New England States were treated to an exceptionally violent wind st rm which issued from the southwest. Middlesex county, Massachusetts, seems to have reaped the full benefit of the storm's fiercest caresses, and the Malden and Melrose Gas Light Company has sufficient cause to remember the visitation, for its managers, since 1 P.M. of the date noted, have viewed with sorrow the wreck of a gasholder whose former capacity was rated at a content of 60,000 cubic feet. The ruined holder was located close to the works, and was one of four operated by the Company, which supplies gas to the boroughs of Malden, Melrose and Medford. The collapse of the principal holder left the company with one (20,000 cu. ft.) holder at Malden, and one each, of similar capacities, at Melrose and Medford. The latter are separated from the works proper by stretches of two miles, and are connected by 6-inch pipes. No wonder, then, that Supt. Bill should feel anxious over the outlook, for on the day of the disaster the output aggregated 113,000 cubic feet, and that sendout has since mounted up to 124,000 cubic feet in 24 hours. He did not waste valuable time, however, but at once telegraphed Messrs. Deily & Fowler, of Philadelphia, who responded promptly to the summons. Mr. Fowler arrived on the ground on Nov. 21st, and the following day left for home under contract to replace the wrecked gasometer by a new vessel rated to contain 95,000 cubic feet. One section of the new holder is to be constructed immediately, and the second will be attended to early in the spring. In the meantime it can be taken for granted that Superintendent Bill is having a right lively time.

The Evils of Imperfect Information.

The London *Journal* makes the following interesting editorial comment: From time to time there appear in the daily papers statements relating to technical matters which would be very much more interesting than they are if the essence of the subject were more frequently included in the reporters' remarks. This observation is often suggested by the perusal of accounts of experiments in connection with the extended utilization of gas and gas works products which occasionally reach us from different parts of the kingdom. Now it is a new gas burner which a local genius has succeeded in perfecting; and we are told all about the surprising novelty, except the duty it is capable of giving. Then it is a wonderful stove or a gas engine which is expected to revolutionize the trade in these articles; only the statements grow elusive just where they should be most precise and unquestionable. Recently the suggested use of tar and tar oils for fuel has furnished a plentiful crop of incomplete rumors of a pseudo-technical cast which are mostly just precise enough to amuse the general newspaper reader, but not sufficiently exact to give any trustworthy information to anyone who is attentively watching for progress in the department of human effort in question. For example, we recently noticed in a north country newspaper a report of a visit of inspection paid by a representative party of gentlemen from Halifax to a chemical works in order to see steam made by the aid of creosote. Everything connected with this experiment was carefully stated except the trifling datum of the quantity of creosote required, and its cost as fuel in comparison with coal. It was the same with the reporter who informed the world that Mr. John Hay, Inspector of Machinery at Woolwich, and Gen. Hyde, of the Indian Department, have for some time past been experimenting with tar and tar oils as fuel for locomotive and stationary boilers. Nobody knows what measure of success attends these efforts. We believe that a great deal is being done in various parts of the country to improve and extend the applications of tar and creosote for steam raising and other purposes for which liquid fuel appears suitable. At the same time it should be understood on the part of investigators that when they are prepared to publish all their results for the encouragement of others, it is idle to allow mangled and incomplete information to reach the world through the agency of ordinary press reporters.

Correspondence

[The Journal is not responsible for the opinions expressed by correspondents.]

Estimating the Flow from the Karg Well, at Findlay, Ohio.

Office Norwalk Gas Light Co.,
Norwalk, Ohio, Nov. 15, 1886.

To the Editor American Gas Light Journal:

Mr. McMillin, in his paper of Aug. 16, says he is uncertain whether the quantity of flow of the Karg well at Findlay, Ohio, was 12 million or 24 million cubic feet per day. I will endeavor to prove that it was 24 million.

We have this formula for calculating the velocity of flow where the length of pipe is short:

$$w_0 = \sqrt{\frac{g\,ct\,(P_0^2 - P_1^2)}{P_0^2\left(S\frac{l}{m} + log\frac{P_0}{P_1}\right)}} = \text{Formula A,}$$

in which w_0 = initial velocity in feet per second.
g = 32.
ct = 47,800; sp. gr. gas, 0.58.
d = diameter in feet.
S = coefficient = .008.
l = length.
P_0 and P_1 = initial and terminal pressures per square foot.

We also have $W = G\,A\,w$ = constant.
W = weight of gas flowing, in lbs., per second.
A = section of the pipe in square feet.
w = velocity, terminal, feet per second.

$$G = \text{density or weight per cubic feet} = \frac{p}{ct}$$

$$\therefore W = \frac{A\,w\,p}{ct} = \frac{A\,w_0\,p_0}{ct}$$

w_0 and p_0 = initial velocity and pressure.

Now, substituting Formula A for w_0, we have—

$$W = \frac{n}{4}\sqrt{\frac{g\,d^5\,(P_0^2 - P_1^2)}{\left(S\frac{4l}{d} + log\frac{P_0}{P_1}\right)ct}} = \text{Formula B, in which } n = 3.1416.$$

Formula B gives the weight of gas flowing per second.

The gas at the Karg well issued from an open 4-inch pipe, and showed, at open end, a pressure of 12½ lbs. on steam gauge. Now, assuming that the pressure at one foot from the end of open pipe was 14 lbs., which is very nearly correct—for the pressure at the casing showed 380 lbs., and said casing was about 200 feet distant from the end of pipe.

Now, from formula A we have the initial velocity equal to 1,300 cu. ft. per second; the area of the 4-inch pipe equals .088 $\therefore$ .088 × 1300 = 115 cu. ft. per second = 11 million cu. ft. terminal discharge every 24 hours. Now, 115 cu. ft. of air weighs at atmospheric pressure 8.8 lbs., and gas, sp. gr. 0.58, = 5.1 lbs. If, therefore, this 115 cu. ft. of gas were at atmospheric pressure, it would weigh 5.1 lbs.; but we will find it weighs 9.98 lbs., for by equation B—

$$W = \frac{n}{4}\sqrt{\frac{g\,d^5\,(P_0^2 - P_1^2)}{ct\left(S\frac{4l}{d} + log\frac{P_0}{P_1}\right)}} = 9.98 \text{ lbs.}$$

On the other hand, if the 115 cubic feet of gas issuing per second be weighed at a pressure of 14 lbs. above the atmosphere it would be found that it weighed 9.98 lbs., the same as we find W to be, thus showing that the gas as it issues from the Karg well is under 12½ lbs. pressure, and weighs nearly double the atmospheric weight of gas per cu. ft. Therefore, when it reaches the atmosphere the 11 million cu. ft. issuing every 24 hours from the end of the 4-inch pipe expands to nearly 22 million cu. ft. You can see this verified by noting the diameter of the flame of the gas when it was lighted and the valve at the 4-inch pipe full open, for at the distance of four feet from the end of the pipe the flame was double the diameter of that which issued from the mouth of the pipe. Very truly,

Geo. H. Christian, Jr., Supt. Norwalk Gas Lt. Co.

The Market for Gas Securities.

Contrary to the general opinion the Consolidated Company, at the Irving Place meeting on Nov. 24th, did not alter the rate of dividend for the last half of year. The dividend checks will be mailed on December 15th to holders of record on November 30th. Perhaps the directors have acted wisely, and it is certain that the shares offer a better investment opportunity now than was the case before. The 1½ per centum declaration ought to leave a heavy surplus in the treasury. Last sale, previous to the time of writing (noon, Nov. 30), was made at 81¼. Other city shares, including Brooklyn classes, are dull and heavy. Among other sales at auction we note 36 shares of Citizens Company, Rochester, N. Y., at 36; 130 Mutual (city), at 105⅛; 58 Metropolitan (Brooklyn), at 74½. There has been a decided movement in gas bonds, in city and out-of-town circles; but, strange to say, at remarkably low prices. The Mercantile Trust Company, 10 Wall street, redeems the coupons on second mortgage bonds of Peoples Company (Chicago, Ills.), which became due on first instant.

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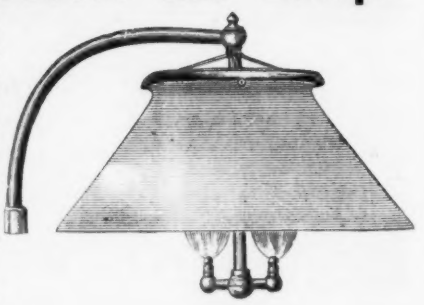

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TO ALL WHOM IT MAY CONCERN.

Notice is hereby given that a suit is now pending in the U. S. Circuit Court for the Northern District of Illinois against the Chicago Gas Apparatus Manufacturing Company and Newman A. Ransom, for infringing our rights under Letters Patent of the United States No. 247,925, dated October 4th, 1881, and No. 333,862, dated January 5th, 1886; and that a similar suit for like infringement has been instituted against W. S. Horry (trading as the Crystal Carbon Light Company), Arthur Kitson (trading as Kitson & Co.), and others, in the U. S. Circuit Court for the Eastern District of Pennsylvania. All persons in anywise infringing upon our rights under said Letters Patent will be prosecuted by us upon our obtaining proof of such infringement.

WALTER J. KIDD, General Manager

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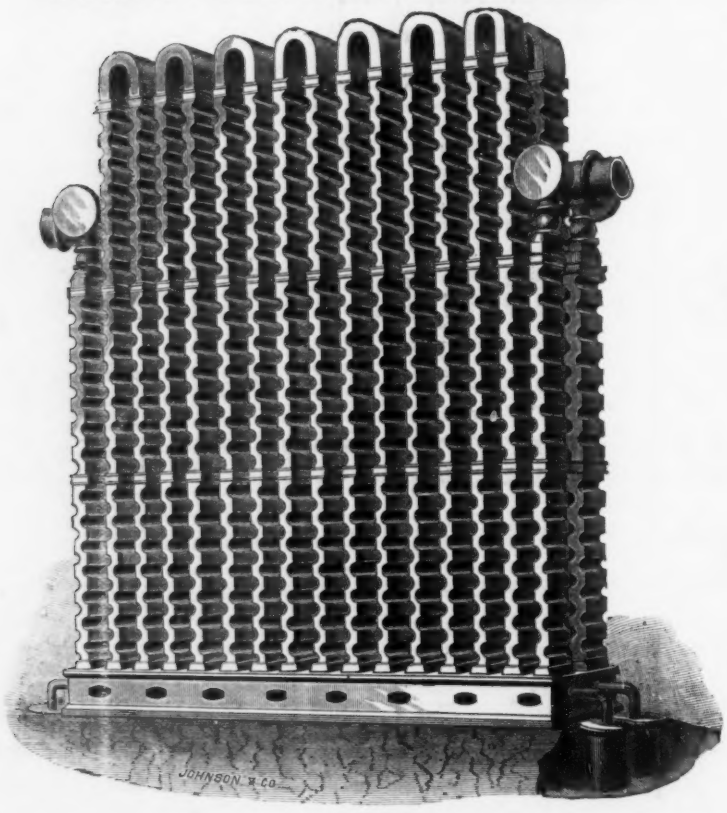

We desire to draw the attention of the gas community to the merits of the SINUOUS FRICTION CONDENSER. Companies intending to introduce new condensers into their works will do well to confer with us and examine plans and estimates before contracting for any other pattern The FRICTION CONDENSER is now in use at the gas works located in the following places:

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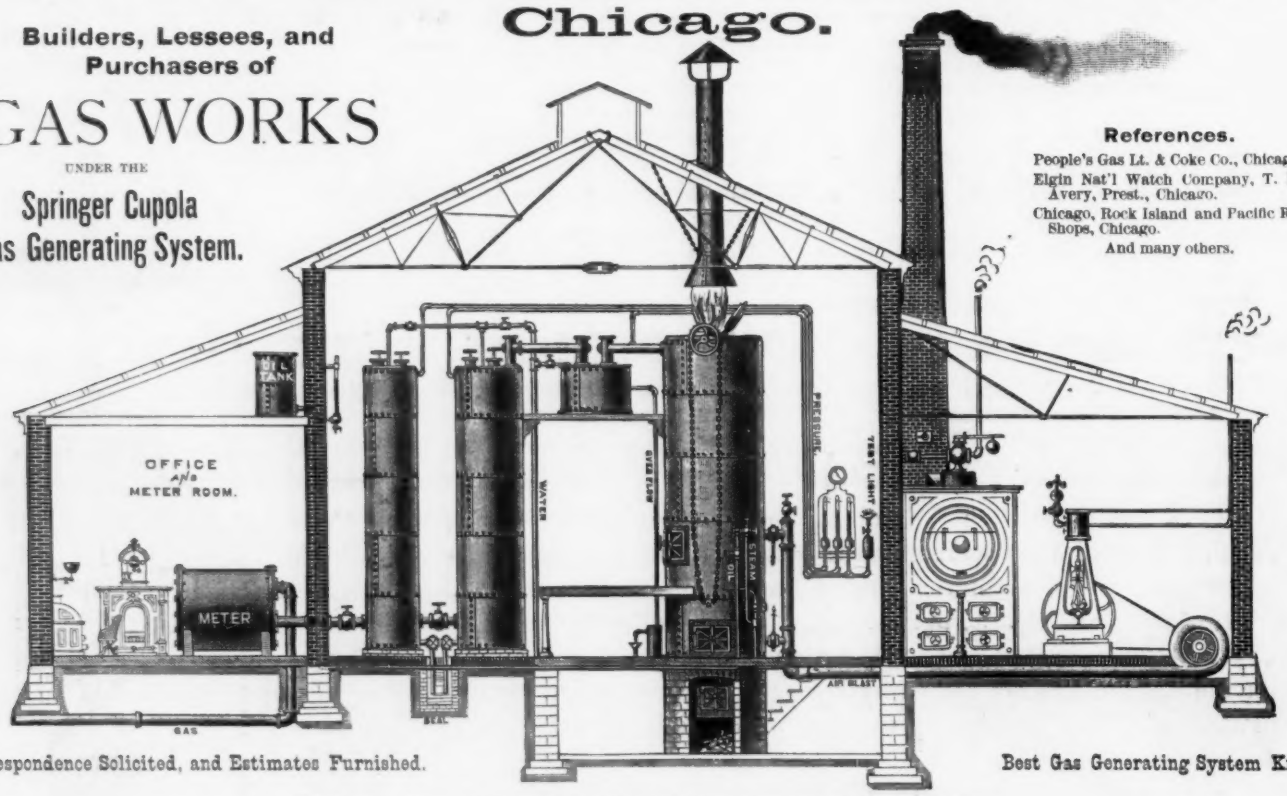

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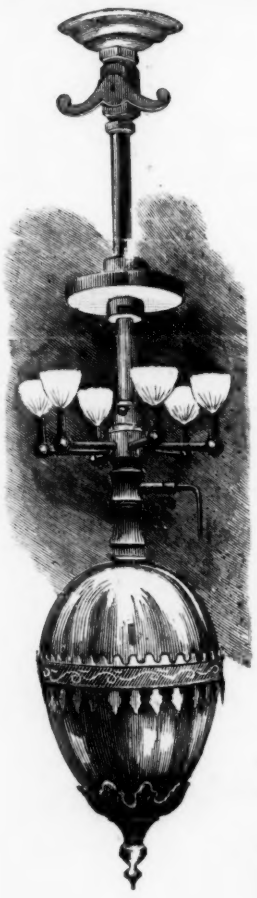

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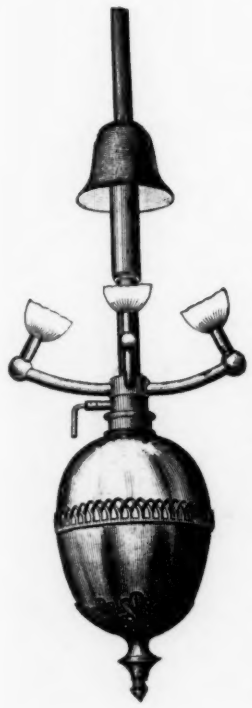

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A Governor that puts the increased pressure on at "one fell swoop" and takes it off in like manner is *not* an "Automatic" Governor; and the circulation of pressure sheets showing such action by a so-called "Automatic" Governor is a rather amusing reflection on the intelligence of Gas Managers.

Strictly speaking, a "Balanced" Governor is an "Automatic" one, as it automatically varies the volume of gas sent out to *maintain a uniform pressure* at its outlet. But, as now applied, the term "Automatic Governor" is understood to mean a Governor that will *maintain pressure between any two desired extremes, in direct proportion to the volume of gas consumed.* Therefore pressure sheets showing *instantaneous changes* from maximum to minimum and *vice versa*, circulated broadcast as the record of an "Automatic (?) Governor," reveals inexcusable ignorance of the subject, amusing to many, yet liable to mislead the inexperienced novice.

We would suggest that all Gas Companies contemplating the placing of *Automatic* Governors would consult their own interests and avoid annoying experience by adopting a Governor *that has a record.*

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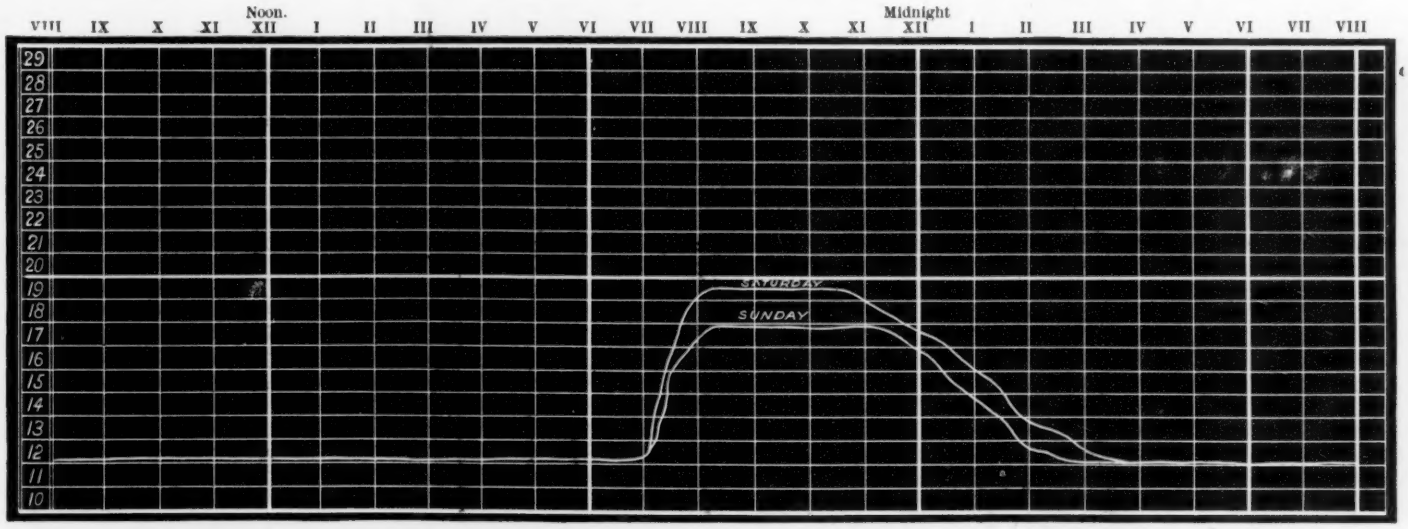
VIII IX X XI Noon. XII I II III IV V VI VII VIII IX X XI Midnight XII I II III IV V VI VII VIII
29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10
SATURDAY
SUNDAY

Card Showing Pressure at the Milwaukee Gas Works, Saturday, July 10, and Sunday, July 11 1886.

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MESSRS. CONNELLY & CO., LTD., 177 Broadway, New York:

Gentlemen—Replying to yours of 29th, I send you a little package of register sheets. When your Governor (20-inch) was set I adjusted it to give 13-tenths day pressure and 22-tenths night pressure. Saturday nights it would run up to 25-tenths. Whenever it would cloud up in the daytime it would go up at first indication of darkness to about 15-tenths. I hunted back in the sheets to find one when pressure was increased in the daytime, but it is so long since we have had a stormy day I could not find one. You can, however, see a *slight change* on sheets for June 1 and June 25. You will see, too, that lately the Governor only puts on *about* 20-*tenths maximum pressure.* This is because *less gas is burned than when it was adjusted.* We have no complaints of pressure, and everyone appears satisfied. In conclusion, can say the Governor has *never been touched* since it was first adjusted, and has at all times *done just the work we wished it to do.* Very truly yours, E. G. COWDERY, Engr. & Supt.

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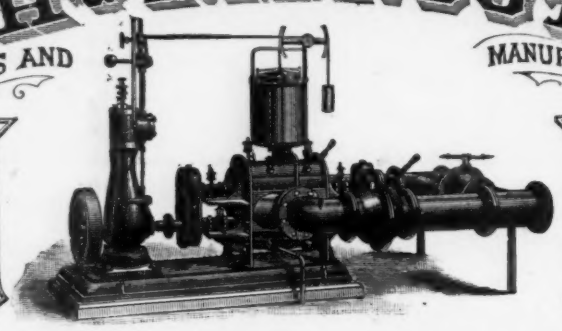

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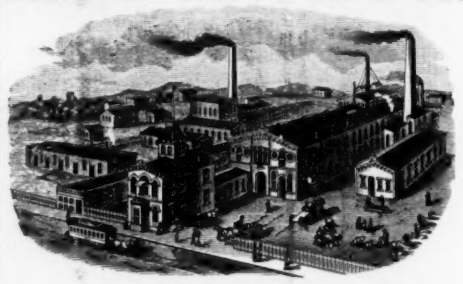

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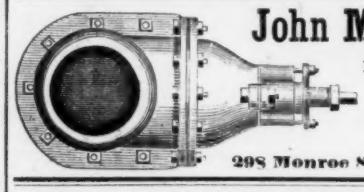

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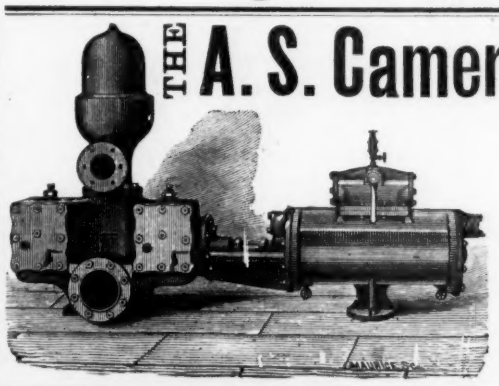

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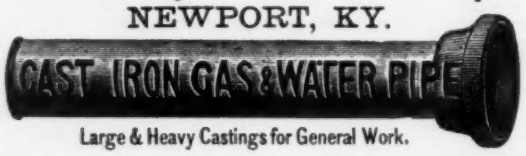

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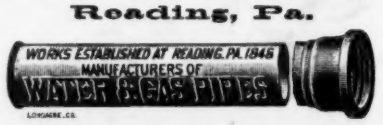

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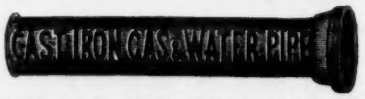

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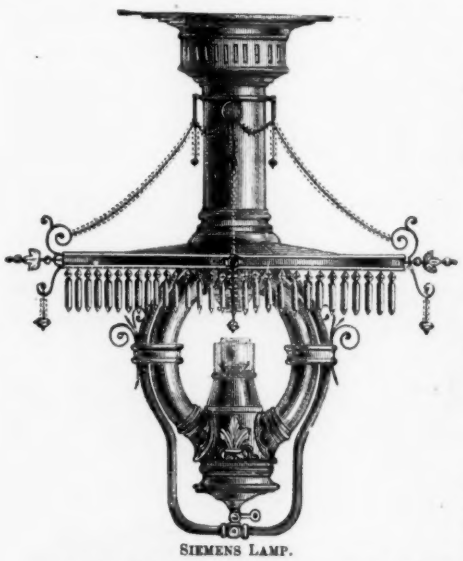

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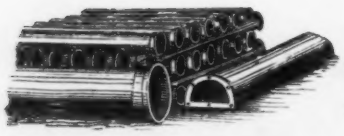

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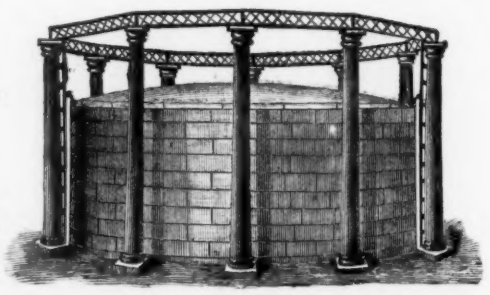

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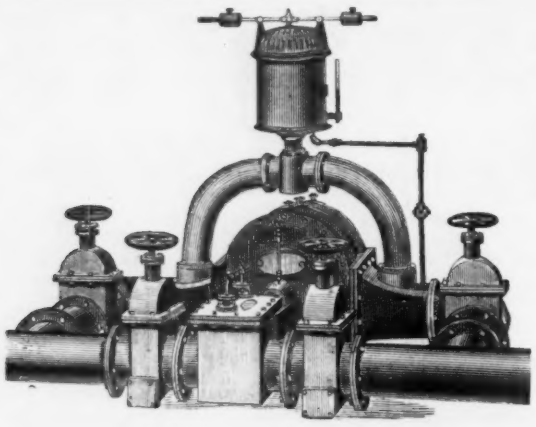

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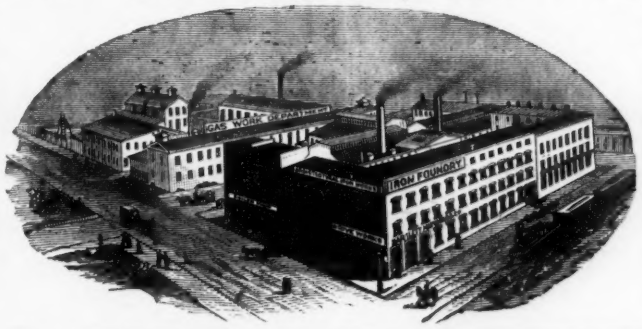

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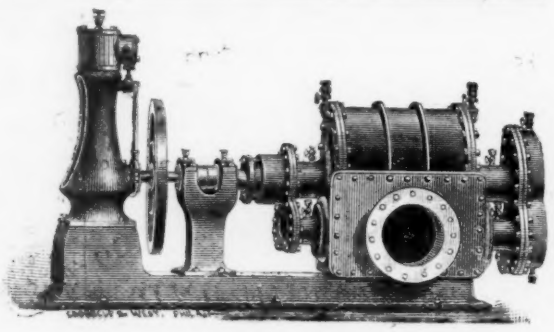

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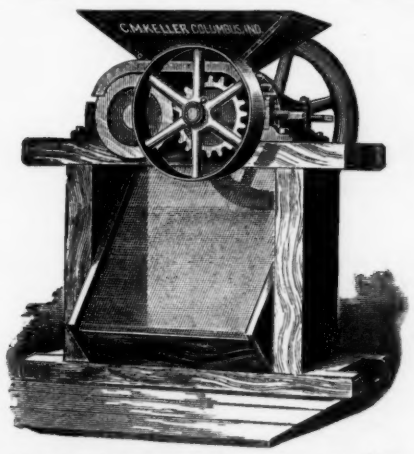

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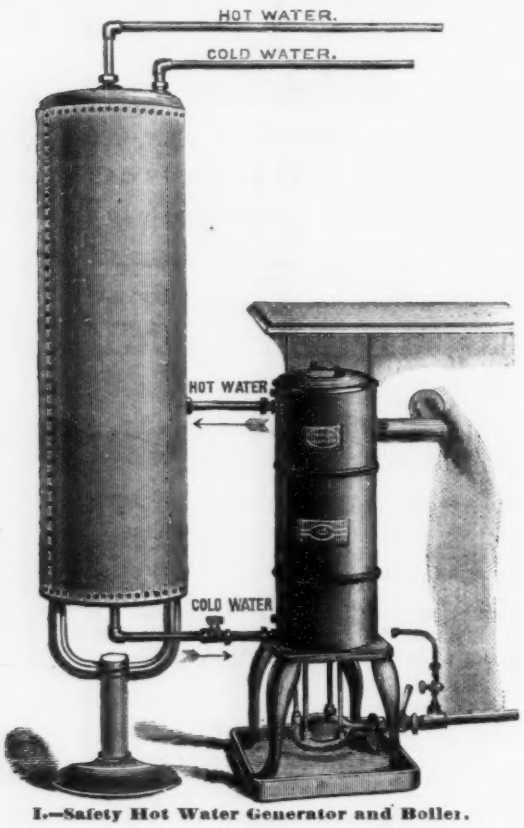

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